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S. Hrg. 103–369

NOMINATIONS OF M.R.C. GREENWOOD, JANE M. WALES, AND ROBERT T. WATSON TO BE ASSOCIATE DIRECTORS OF THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Y 4.C 73/7:S.HRG.103-369

Nominations of M.R.D. Greenuood, Ja...

HEARING

BEFORE THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION UNITED STATES SENATE

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

OCTOBER 28, 1993

Printed for the use of the Committee on Commerce, Science, and Transportation

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NOMINATIONS OF M.R.C. GREENWOOD, JANE M. WALES, AND ROBERT T. WATSON TO BE ASSOCIATE DIRECTORS OF THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY

THURSDAY, OCTOBER 28, 1993

U.S. SENATE,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Washington, DC.

The committee met, pursuant to notice, at 10:15 a.m. in room SR–253, Russell Senate Office Building, Hon. John D. Rockefeller IV, presiding.

Staff members assigned to this hearing: Patrick H. Windham, senior professional staff member, and Rebecca A. Kojm, professional staff member; and Louis C. Whitsett, minority staff counsel, Emily J. Gallop, minority professional staff member, and Susan Adams, minority deputy staff director.

OPENING STATEMENT OF SENATOR ROCKEFELLER

Senator ROCKEFELLER. Good morning, everybody. Oh, Dr. Watson is here, good. I want to welcome everybody to this hearing on President Clinton's nominations of Robert Watson, Mary Rita Greenwood, and Jane Wales to be Associate Directors—three of the four, the fourth one already being there, to be Associate Directors of the White House Office of Science and Technology Policy.

President Clinton and his administration have begun, I hope and pray, a revolution in American science and technology policy. It is not fully in gear yet, so that is why this nomination process is so important. A move away from the old priorities of what we all hope will be the permanent end of the cold war to the new priorities of economic competitiveness and health care, which I will just slip in there for the benefit of everybody, and environmental protection.

The three nominees that we consider this morning will be key members of that new science and technology team and major players in the transformation of the American research programs.

Under the 1976 Science and Technology Act, the President may nominate up to four OSTP Associate Directors. Reflecting the importance that he attributes to science and technology, this President has chosen to fill all four posts. The Senate has already confirmed Skip Johns for one of these positions, and the President and OSTP Director John Gibbons have assigned him to handle technology and space policy. Mr. Chairman, your comments, please.

OPENING STATEMENT OF SENATOR HOLLINGS

The CHAIRMAN. I am pleased that the committee is holding this morning's hearing on the nominations of Robert Watson, Mary Rita Greenwood, and Jane Wales to be Associate Directors of the Office of Science and Technology Policy.

OSTP plays a pivotal role in efforts by this administration and Congress to reorient Federal research policies to meet the needs of the postcold war era. These nominees, if confirmed, will take an active role in reshaping and updating Federal programs and budget priorities.

The nominees before the committee today have the type of experience needed to meet these challenges. The nominees' records are indeed impressive. I look forward to reviewing this morning's testimony, and to working with the nominees, if confirmed.

Thank you, Mr. Chairman.

Senator ROCKEFELLER. Thank you, Mr. Chairman. We welcome all of you to the Commerce Committee and look forward to hearing from you. My colleague, if he wants to say something, Senator Burns, and then I want to turn it over to Dr. Jack Gibbons. But I want to also note for the record that Senator Nunn had wanted to be here this morning in order to say something about you, Jane, and introduce you. But he has to chair another hearing at this time and I have put his full statement in the record, as he requested, all of which is highly flattering.

[The prepared statement of Senator Nunn follows:]

PREPARED STATEMENT OF SENATOR NUNN

I am pleased to introduce to the Commerce Committee Ms. Jane Wales, to commend her to the Committee and recommend that she be confirmed as Associate Director for National Security and International Affairs in the Office of Science and Technology Policy.

I have come to know and admire Jane's work over the past several years, during the time that Jane served as chair of the Carnegie Corporation's program on Cooperative Security. To the extent that the so-called "Nunn-Lugar" legislation on cooperative denuclearization of the former Soviet Union has been successful, a large share of the credit goes to Jane. She assembled a team of scientists and security analysts to take a fresh look at the problem 'of proliferation of nuclear and other weapons. One of the individuals Jane selected was Dr. Ashton Carter, who produced an excellent, timely study of nuclear weapons in the Soviet Union and who subsequently has been named as the Assistant Secretary of Defense in charge of "Nunn-Lugar" programs. The studies produced by Ash Carter and other specialists contributed directly to the legislative initiative that Dick Lugar, Claiborne Pell, John Warner, Jim Exon, Pete Domenici, David Borin, Carl Levin, I and others sponsored in the fall of 1991 to assist the then-Soviet Union to destroy nuclear weapons.

This is a good example of how a non-profit organization like the Carnegie Corporation, staffed with highly-qualified and imaginative individuals like Jane Wales, has made a major contribution to what I believe has been sound public policy. Other examples I am personally familiar with, and in which Jane played a leading role, involve important, timely studies of plutonium disposition and of conversion of the former Soviet military-industrial complex to civilian pursuits.

In addition, I have come to know Jane well as a colleague in the Aspen Strategy Group as well as in former Senator Dick Clark's Aspen Institute seminars on East-West relations. I have found Jane to be thoughtful and balanced in her approach to complex issues, candid in her assessments, and reliable in her judgments.

In short, Mr. Chairman, I am confident that if confirmed, Jane Wales will bring to the Office of Science and technology Policy the energy, intelligence, scientific knowledge and dedication to scholarship that she demonstrated in the various projects that she and I have worked on together over the past several years. I believe she is an outstanding choice for the position of Associate Director for National

Security and International Affairs. I recommend her to you with enthusiasm, and without reservation.

Senator ROCKEFELLER. Let me continue with one more thing. Dr. Watson is a noted atmospheric chemist, highly regarded for his knowledge of global climate change. He has served for many years at NASA. Dr. Gibbons has indicated that Dr. Watson, if confirmed, will handle environmental policy.

Dr. Greenwood is a nationally recognized nutrition expert and is a member of the Institute of Medicine. She is dean of graduate studies at the Davis Campus of the University of California and the chair of the University of California council of graduate deans. If confirmed, as I suspect she will be, she will be responsible for science policy.

Jane Wales served as Deputy Assistant Secretary of State during the Carter administration. She is an arms control specialist who most recently chaired the cooperative security program of the Carnegie Corporation of New York. And Dr. Gibbons will assign her responsibilities for national security and international affairs if she, as I suspect, is confirmed by the Senate.

So that I turn now to my patient colleague to whom I have already apologized for being uncharacteristically late. [Laughter.]

[The prepared statement of Senator Rockefeller follows:]

PREPARED STATEMENT OF SENATOR ROCKEFELLER

Welcome to the Subcommittee's third hearing this year on the National Aeronautics and Space Administration. Today, we are examining NASA's contributions to the U.S. economy and to U.S. competitiveness.

At our hearing in April, when we focused on the NASA budget, I cited an article which argued that our space program is no longer relevant to U.S. industrial competitiveness. I am not prepared to agree with that judgment. But in light of the pressures that led Congress this summer to enact a budget with $500 billion of deficit reduction, and to battle for real cuts in other government spending in the recent appropriations bills, I believe it is this subcommittee's obligation to examine whether and how NASA's programs benefit the U.S. economy. More specifically, this hearing is designed to explore if NASA, while meeting its own mission needs, is effectively and efficiently collaborating with American manufacturers in the development of important technologies. This question, of course, seeks the connection between investing in NASA and investing in economic growth and jobs for Americans.

As part of our effort to win the Cold War, NASA was created in 1958 to ensure U.S. preeminence in aeronautics and space. In the post-Cold War era, with its diminished international threat to our national security, it is our country's international economic competitiveness that will increasingly guaranty our national well-being. It is therefore important that we in government increase our focus on international economic competition. NASA, as well as other agencies created to pursue technological missions, should be in a good position to adapt to these changes and help U.S. companies be more competitive. The jury is still out on whether that is happening.

With this change in national priorities, NASA needs to develop a comprehensive strategy that ensures its programs are relevant to the increased importance of economic competition. In developing this strategy, NASA must look at its entire R&D program, not just the fraction that is currently devoted to the mechanism of technology transfer and innovation. Equally important, NASA must assess its existing programs designed to help industry, to determine whether the benefits are commensurate with the funding that NASA receives.

For example, out of its $7.5 billion research and development budget, NASA will spend only $1 billion on aeronautics. I wonder if that is an appropriate allocation given the increased international competition faced by the U.S. aircraft industry. NASA's long collaboration with U.S. aircraft manufacturers helped our country achieve leadership in aeronautics and contributed to a substantial trade surplus in this area. However, that leadership is now being challenged.

Most of the remaining R&D budget is directed to space projects. In this area, NASA's R&D funds have traditionally been used to develop highly specialized space hardware to fulfill its mission requirements. Unlike its work in aeronautics, NASA's space programs have not worked closely with industry in identifying and developing commercially useful technologies. Instead, it has established separate programs to "spin-off" space technologies for possible commercial uses. Can we still afford the luxury of such single-use technology development programs? Or can we increase the taxpayers' return on their investment in NASA?

In this fiscal year, NASA has been appropriated over $400 billion for the programs it established to help U.S. industries use NASA space technologies. Some of these programs have been funded since 1962. It is time to assess their real contributions to the U.S. economy.

An additional $113 million in R&D funding will be set-aside in NASA for the Small Business innovation Research program. With the recent reauthorization of the SBIR program, the amount of money set-aside in NASA's budget for small business research proposals will continue to increase. However, it appears that many in NASA view the SBIR initiative as a "tax" on its R&D program, rather than an opportunity to encourage the development of technology that also has important commercial uses.

Finally, for FY 1994, NASA has allocated about $200 million for a new technology investment package aimed at fostering new aerospace technologies through partnerships with industry. funded as part of other NASA,program budgets, this investment package reflects NASA's desire to make some of its programs more relevant to U.S. competitiveness.

But I have to wonder whether creating another technology collaboration program within NASA is the best way to ensure that NASA is relevant to the U.S. economy. I think that making technology collaboration a central tenet of all NASA R&D programs and making technology innovation a central tenet of all NASA procurement programs may be better ways of increasing NASA's relevance to the U.S. economy.

These are some of the issues the Subcommittee will examine this morning, and I hope that the Administration and NASA leadership share our interest in this line of inquiry. In this new era, we all should be open to changes that strengthen both our space program and our economy.

Senator ROCKEFELLER. Senator Burns.

Senator BURNS. I have not looked at the report card lately. Thank you, Mr. Chairman. I appreciate this. I do not have an opening statement. I just want to welcome each of the candidates, nominees here today and thank them for coming, and I look forward to their testimony.

Senator ROCKEFELLER. Thank you, Senator Burns. Dr. Gibbons.

STATEMENT OF JOHN GIBBONS, Ph.D., DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Dr. GIBBONS. Mr. Chairman and Senator Burns, thank you very much for receiving us today. This committee's early confirmation of my position has been very helpful to me in these past 9 months, as has the committee's intense interest and support of science and technology as an enabling force to our Nation. We are trying to move ahead toward a more secure, competitive, and brighter future for our Nation, not only in terms of jobs and the economy, but also improving our environment. So, again, we very much appreciate the committee's indulgence in having these three nominees, the final ones for OSTP, before you today.

Your introduction, Mr. Chairman, was so splendid. I would simply add that I am extremely pleased that the President has chosen these three nominees for those remaining positions at OSTP. I think if you look at these three collectively in terms of their backgrounds and their experiences, it bodes well for our ability to move ahead in what you have properly termed, Mr. Chairman, a kind of a revolution. We must rethink the role of science and technology in our future, along with the interplay between the public and private sectors in developing and applying these technologies in the public interest as well as private interest.

So, I have a swelled head this morning in being able to come before you with three such extraordinarily well qualified candidates. And I simply now would like to sit back and listen to the proceedings. The background of these people means that they should be able to answer any and every question that you might have for them, and I will quit at that. Thank you, Mr. Chairman. [Laughter.]

Senator ROCKEFELLER. And I might just comment, and then I would turn right away to Dr. Greenwood, I think that it ought to be said from time to time that public service is a good thing. And that while the rest of the country is busy withering Washington and everything that we do, and particularly those of us in the Congress, any time somebody comes to Washington to serve in the executive branch or the legislative branch of Government, they are, by definition, losing money, losing privacy, losing the time to see their spouses or their children.

I calculated several days ago that I have dinner with my children and my wife on weekdays about once every 2 months. And this is something people do not understand out there. So, not only to you, Dr. Gibbons, but to the three nominees, it just needs to be said to the American people and anybody who is within sound of this voice, that public service is honorable and that in spite of all the cynicism and skepticism across the country, thank God that people of superb talent continue to come, to want to work.

Dr. GIBBONS. Thank you.

Senator ROCKEFELLER. Dr. Greenwood.

STATEMENT OF M.R.C. GREENWOOD, Ph.D., ASSOCIATE DIRECTOR-DESIGNATE, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Dr. GREENWOOD. Thank you, Mr. Chairman and Senator Burns. Please let me begin by saying that it is really, as you said, a great professional and personal honor for me to be here this morning. And I am deeply grateful to have been nominated by President Clinton as the Associate Director for Science in the Office of Science and Technology Policy. And with your consent, I really look forward to working with the administration and with Congress and to serving the Director of OSTP, my colleague Dr. Jack Gibbons.

The scientific discoveries arising from fundamental research in the past have been at the heart, as you know and as you have alluded to, to many changes in the way we live and work. And, indeed, I think they are increasingly reflected in the astonishing rate at which the entire world has changed during my lifetime. And as nations around the world plan for their own future and develop new sets of relationships with other nations, political leaders, as we all know, are becoming increasingly aware and see science and technology as powerful, revolutionary forces.

So, it is with this in mind that I come to you today to suggest that we stand at the threshold of a new century that will see a continuation of these rapid changes that have their roots in scientific discovery and application. There is no doubt in my mind that this scenario of change, much of it driven by science and technology, creates the need for a new consideration of the relationship between science and Government, for reexamination of the traditional roles of science and technology, and for a better understanding of the ever more complex interactions between science and technology.

Today the United States remains in the enviable position of leadership in most areas of fundamental science. This is apparent, as you all know, by almost any measure you care to take: publication counts, citations, and, most recently, Nobel Prizes. Yet there are some indicators that worry me, and I am sure they worry you as well, that all is not well and that we need to continue to move aggressively and strategically as we secure our position for the future.

And some of the problems I know we will be facing together as we move into a period of relatively slow or flat growth of funding for research, is the difficulty of coping with these budget deficits. Resource allocations and the problems of priority setting will become even more acute. In my opinion, it is essential to maintain a well-balanced portfolio of scientific investments that can continue to ensure the flow of new discoveries, to stay up with or ahead of other industrial nations' research capacities.

We also have to be concerned, as many of you have mentioned, about the inadequate state of affairs in our research infrastructure. This is an area of increasingly grave concern. And I am personally concerned and professionally concerned about the relatively poor performance of U.S. students in science and mathematics, because this is of direct concern to our economic system and to the future of our country and its ability to build on our science and technology base.

President Clinton mentioned the support of fundamental science in his February 22 document when he said among his three primary goals, and I quote, that we must remain focused on "world leadership in basic science, mathematics, and engineering," which includes strong and sustained support for basic science to protect the source of future innovations.

So, as the OSTP Associate Director for Science, if confirmed, it will be my responsibility to work with the Director, and other officers in the Executive Office of the President, and key Federal agencies, Congress, and a large number of external stakeholders outside the Federal Government.

It is with humility that I face the large number of matters that are on our national agenda for science and technology, but I hope you will agree with the President and Jack Gibbons' view that I bring a well-rounded set of credentials to the office of the President. And let me touch on those for just a moment.

First, I am a scientist. And even today I can personally relate to the young graduate students who are just getting started in their careers or worrying about how they are going to finance their graduate education. For me, an NSF undergraduate summer grant in chemistry many years ago was pivotal in shaping my lifelong plans, and led to my subsequent career.

And another feature that I hope will be of value is that I have been connected with a large and broad range of educational and research institutions, ranging from large private research universities, to a small liberal arts college and, most recently, one of the largest public institutions in the country. And I hope I have absorbed some important lessons along the way, including listening to many points of view, trying not to rush to conclusions, valuing the importance of hearing the various sides of issues from a variety of sources, and I hope this will stand me in good stead.

So, in closing, if confirmed and with your help, I will do my utmost to ensure that this country's future is strengthened by a set of science policies of the highest quality. And finally I would like to take a moment to publicly thank my son Jim, who could not be here today, for his love and patience as he has put up with the extraordinary erratic hours and extensive travel of a scientist mom for many years. And I would also like to thank President Clinton and Jack Gibbons for this opportunity to serve.

Thank you.

[The prepared statement, biographical data, and questions and answers of Dr. Greenwood follow:]

Prepared Statement of M.R.C. Greenwood

It is a great professional and personal honor for me to appear before you today. I am deeply grateful to have been nominated by President Clinton as Associate Director for Science in the Office of Science and Technology Policy. With your consent, I look forward to serving the Administration by working with the Director of OSTP, Dr. John Gibbons, and other key members of the Clinton Administration. Working closely and cooperatively with Congress will be especially important in our joint efforts to insure the continued growth and vitality of our nation's scientific and technological enterprise.

IMPORTANCE OF SCIENCE AND TECHNOLOGY AND THE SPECIAL ROLE OF SCIENCE

The scientific discoveries arising from basic research in the past have been at the heart of many fundamental changes in the way we live and work—indeed, they are reflected in the astonishingly rapid rate at which the entire world has changed during recent decades. As nations around the world plan for their own futures and develop new sets of relationships with other nations, political leaders have increasingly come to see science and technology as powerful, revolutionary forces. It is with this in mind that I come before you today to suggest that we stand at the threshold of a new century that will see a continuation of the rapid changes that have been the striking characteristic of recent times.

There is no doubt in my mind that this scenario of change—much of it driven by science and technology—creates the need for a new consideration of the relationship between science and government, for a re-examination of the traditional roles of science and technology, and for a better understanding of the ever more complex interactions between science and technology. For example, while synergistic effects between science and technology are more common now than in the past, and the time scale between the discovery of new knowledge and its application is much shorter, there remain fundamental differences—in purpose, in performance, and in results—between science and technology. In the years ahead, Congress, the Administration, and members of the science and technology community must, I think, work together on achieving a better understanding of these roles and relationships and the way they shape national destiny.

All of this work should be aimed at reaching a better understanding of the changes underway and making the right kinds and levels of investment in the intellectual capital of our nation. Among the circumstances we face are: 1) the increasing sophistication of fundamental research and its dependence on more complex and powerful instrumentation; 2) the growing complexity of the problems that are being addressed by science; and 3) the need to bring the knowledge and insights from a variety of scientific disciplines and a variety of perspectives to achieving a deeper understanding of complex phenomena. For example, recent work related to the "Decade of the Brain" vividly shows the need for integration of new knowledge from such diverse fields as molecular biology, chemistry, physics, mathematics, genetics, neurology, medicine and the social and behavioral sciences.

THE STATE OF SCIENCE IN THE UNITED STATES

The United States remains in an enviable position of leadership in most areas of fundamental science. This is apparent by almost any measure one cares to use—from publication counts, to citations, to Nobel awards. Yet there are some indicators that all is not well, and that we must move aggressively and strategically to secure our position for the future.

- As we move into a period of relatively slow or flat growth of funding for research while coping with our budget deficit problems, resource allocation and priority-setting problems will become more acute. However, even in such an environment, it is essential to maintain a well-balanced portfolio of scientific investments to insure a continuing flow of new discoveries; to stay up with—or ahead of—other industrial nations' research capabilities; and to improve our ability to link the advance of knowledge with broad national goals such as economic strength, health and environmental quality, and national security.
- The inadequate state of affairs in our research infrastructure—lack of stable investigator funding as well as inadequate facilities and equipment, especially in our research universities—is a matter of increasingly grave concern. We will need a multiagency, long-term, non-partisan policy to provide remedies in the years ahead, or the negative consequences for U.S. research and economic well-being could be far-reaching.
- Those of us involved with science cannot be indifferent to the evidence of the relatively poor performance of U.S. students in science and mathematics. This is of direct concern to our economic system and the work place that ultimately employs these students. Nor can the marked scientific and technical illiteracy of large numbers of U.S. citizens be a matter of much comfort. It is from this general population pool that our science and engineering work force of the 21st Century will come. We must do better in our educational system.

The support of science is mentioned specifically in President Clinton's February 22nd policy document, Technology for America's Economic Growth: A New Direction to Build Economic Strength. Among the three primary goals, the President stated that we must remain focused on "world leadership in basic science, mathematics, and engineering" which includes "strong and sustained support for basic science to protect the source of future innovations."

MY POSITION AND RESPONSIBILITY

As the OSTP Associate Director for Science, it will be my responsibility to work with the Director, other offices in the Executive Office of the President, key agency offices, Congress, and a large number of concerned stakeholders outside the federal government. My portfolio will include a broad range of issues—the life sciences, the physical sciences, mathematics, engineering, and the social and behavioral sciences. As a provider and facilitator of timely information and advice, I expect to be helpful in setting budget and program priorities and in bringing about more effective management of the research enterprise. In other areas such as science, engineering and mathematics education, I will be working to help improve our overall performance. Finally, on subjects such as integrity in science, research facilities, and government-university relationships in the performance of research, I expect to play an active role.

MY CREDENTIALS AND HOPES

It is with a great deal of humility that I face the large number of matters on our national agenda in science. No single person could hope to possess all of the requisite talent and background, but I hope you will agree with the Presidentls and Jack Gibbons' views that I bring a well-rounded set of credentials to the Executive Office of the President.

First, as a scientist, I will bring a practical perspective to the political process that will permit us to work together effectively on many of the matters I have mentioned today. Science "is in my blood" and has been a central interest for me since I was a small child. And even today I can personally relate to the young graduate students who are just getting started in their careers or worrying about how they will finance a graduate education. An NSF undergraduate summer grant in chemistry years ago was pivotal in shaping the plans that ultimately led to my graduate work at the Rockefeller University. In turn, this led to twenty-five years of laboratory research, substantial peer-reviewed grant funding, close interactions with many students and colleagues in the science world, and cherished mentors who helped bring me along.

Another feature of my experience that I hope will be of value is that I have been connected with a broad range of educational and research institutions—including the Rockefeller University, a major research institution; Vassar, a small liberal arts college; Columbia Medical School; and most recently, the largest public university in the nation, the University of California at Davis. It is with UC Davis that I acquired vital senior level administrative experience as Dean of Graduate Studies.

As part of staying involved in my multidisciplinary interests in science, I have served as an officer in several different scientific and professional societies. In 1992 I was elected to the Institute of Medicine, and until my nomination by the President, served as Chair of the Food and Nutrition Board at the Institute of Medicine/ National Academy of Sciences.

From NSF summer student to graduate school dean, I think I have absorbed some important lessons that should be enormously helpful to me in this new position: listen to many points of view; never rush to conclusions; and value the importance of hearing the various sides of an issue from a variety of sources. And I intend to apply these lessons in working with you!

CONCLUSION

If confirmed—and with your help—I will do my utmost to insure that this country's future is strengthened by a set of science policies of the highest quality. These policies will be aimed at creating a fertile environment for scientific discovery as well as enhancing processes for the dissemination and transfer of knowledge for technical applications and for the well-being of our people and our global neighbors.

Finally, I would like to take a moment to thank publicly my son James for his love and patience as he put up with the erratic hours and extensive travel of a scientist mom over the years. Also I would like to thank President Clinton and Jack Gibbons for this opportunity to serve my country. And for my mentors who helped make it possible for me to be here today, Professors Margaret Wright, Elbert Tokay, Sue Lumb, Jules Hirsch, and the recently deceased Anita Zorzoli and Eliot Stellar as well as others, my gratitude is boundless.

Thank you, Mr. Chairman.

BIOGRAPHICAL DATA

Name: Greenwood, Mary Rita (M.R.C.) Cooke; address: 5033 El Cemonte Avenue, Davis, CA 95616; business address: 252 Mrak Hall, Graduate Studies, University of California, Davis, Davis, CA 95616.

Position to which nominated: Associate Director for Space; date of nomination: August 9, 1993.

Date of birth: April 11, 1943; place of birth: Gainesville, FL.

Marital status: Divorced; names and ages of children: James Robert Greenwood, 31.

Education: Auburn East High School, 1961; Vassar College, A.B., 1968; Rockefeller University, Ph.D., 1973; and Columbia University, postdoctoral fellow, 1974.

Employment: 8/19/93, Present Associate Director (Designate) for Science, Office of Science and Technology Policy Executive Office of the President, Washington, DC; 7/1989, Dean, Graduate Studies (on leave pending confirmation), University of California, Davis, CA; 10/92–9/93, Interim Reporting Dean for the Division of Education, University of California, Davis, CA; 7/1989–, Professor, Department of Nutrition, University of California, Davis, CA (on leave); 7/1989–, Professor, Department of Internal Medicine, University of California, Davis, CA (on leave); 7/1989–90, Adjunct Professor, Department of Biology, Vassar College; 1986–1989, Chair, Department of Biology and John Guy Vassar Professor of Natural Sciences; 1988–89, Director, the Howard Hughes Biological Sciences Network Program, Vassar College; 1986–88, Director, Undergraduate Research Summer Institute, Vassar College; 1985–89, Director, Animal Model CORE Laboratory of NIH Obesity Research Center Consortium, The Rockefeller University, St. Luke's-Roosevelt Hospital, Vassar College; 1981–86, Professor, Department of Biology, Vassar College; 1985, Visiting Professor, Department of Clinical Chemistry, University of Lund, Lund, Sweden; 1978–89, Adjunct Assistant Professor, Institute of Human Nutrition, Columbia University; 1981–85, Director, Adipose Tissue Laboratory, Obesity Research Center, Columbia University; 1982, Visiting Scientist, University of Washington Medical School, Feb–June; 1978–81, Associate Professor, Department of Biology, Vassar College; 1974–79, Adjunct Research Associate, The Rockefeller University, New York; 1976–78, Assistant Professor, Human Genetics and Development, Institute of Human Nutrition, Columbia University; 1977–78, Adjunct Assistant Professor, Department of Biology, Vassar College; 1975–76, Adjunct Assistant Professor, Human Genetics and Development, Institute of Human Nutrition, Columbia University; 1974–75, Research Associate, institute of Human Nutrition, Columbia University; 1974–75, Adjunct instructor, The Pratt Institute, Brooklyn, New York; 1973–74, Postdoctoral Fellow, Institute of Human Nutrition, Columbia University; and 1968–73, Graduate Fellow, The Rockefeller University, Laboratory of Human Behavior and Metabolism directed by Dr. Jules Hirsch.

Government experience: Member, Food and Drug Administration Science Board, Department of Health and Human Services, 1993; National institutes of Health, Task force, Future of Biomedical Careers for Women, 1993; Member, NIH Nutrition Study Section1 1983-87; Reviewer for 2-3 NIH or NSF ad hoc study sections a year, 1978-83; Co-Author (with P.R. Johnson) of NIH pamphlet on Obesity, completed in early 1980; and Site visitor for EDC review group, 1979.

Political affiliations: No offices, miscellaneous small contributions to local democratic candidates.

Memberships: *Professional Societies:* Institute of Medicine of the National Academy of Sciences; Academy of Behavioral Medicine Research; American Association of the Academy of Sciences; American Dietetics Association; American Institute of Nutrition; American Psychological Society; American Society for Clinical Nutrition; American Physiological Society; The Harvey Society; New York Academy of Sciences; North American Association for the Study of Obesity (NAASO); Phi Kappa Phi; Prytanean Society (Honorary Member); Sigma Xi; and Society for Experimental Biology and Medicine.

SERVICE IN NATIONAL AND INTERNATIONAL PROFESSIONAL SOCIETIES

Institute of Medicine/National Academy of Sciences—Chair, Food and Nutrition Board, Institute of Medicine/National Academy of Sciences, 1991–; Member, Food Forum, Food and Nutrition Board, Institute of Medicine, 1993; U.S. National Committee for the International Union of Nutritional Sciences (USNC/IUNS), 1991–; Member, Program Committee, Institute of Medicine, 1990–; Member, Food and Nutrition Board of National Research Council, National Academy of Sciences, 1985–; and Correspondent, Committee on Human Rights, 1993.

American Institute of Nutrition (AIN/ASCN): Vice President-elect, The American Society for Clinical Nutrition, 1993–; Co-Chair, FASEB Summer Conference Energy Balance and Nutrient Partitioning, Vermont, July 1989; Chair and Organizer, FASEB symposium, 1988; Chair, American Institute of Nutrition (AIN) Minisymposium, Animal Models of Obesity, 1986; and Nominating Committee, AIN, 1987, 86.

Member, AIN Mead Johnson Award Committee, 1986; Chair or Co-Chair for FASEB Obesity sessions, 1986, 85, 82, 81, 80; Chair, American Institute of Nutrition (AIN) Osborne-Mendel Award Nominating Committee, 1984; Member, AIN, Osborne-Mendel Award Nominating Committee, 1983, 1982; XII International Congress of Nutrition, San Diego, California, 1981, member of the Program Committee.

International Association for the Study of Obesity (IASO): Treasurer, International Association for the Study of Obesity, 1991–; Governing Board Member, International Association for the Study of Obesity (IASO) 1988–present; Co-Editor, Proceedings of the Adipose Tissue Satellite Meeting of the IV International Congress on Obesity, International Journal of Obesity, 1985; Organizing Member, International Association for the Study of Obesity (IASO); IV International Congress on Obesity, New York, 1983; Organizing Board Member and Co-Chair of Satellite Conference on Cellularity held at Vassar College; Chair, Abstract Selection Committee Second international Congress on Obesity, Washington, D.C., Chair of the Program Committee, member of the Organizing Committee, 1977.

North American Association for the Study of Obesity (NAASO): President, North American Association for the Study of Obesity, 1987–88 (Vice President 1986-87); Chair, Publications Committee, North American Association for the Study of Obesity (NAASO) 1986–89; Councilor, North American Association for the Study of Obesity (NAASO), 1983–85; Second International Congress on Obesity, Washington, D.C., Chair of the Program Committee, member of the Organizing Committee, 1977.

Other: Advisory Committee, Benjamin Franklin/Lafayette Seminar, 1988–; Editor, Proceedings of the NIH Workshop on the Characterization of Human Obesities, International Journal of Obesity, 1984; Co-Chairman of "Workshop on the Characterization of Obesity" (funded by the NIH) held at Vassar College, Oct. 17-19, 1982; Executive Board, Obesity Research CORE Center Consortium (ORC), St. Luke's-Roosevelt Hospital, Columbia University, Rockefeller University, Vassar College, 1980–; Consultant, Hoffman-LaRoche, Inc.; Councilor, American Diabetes Association; Consultant, Campbell Soup Company, April 1992–; and Co-Chair, Civic Task

Force, Linking Education & Economic Development (LEEDS), Sacramento, CA, 1993.

Regional and National Higher Education Committees and Service; Evaluator, Western Association of Schools and Colleges (WASC), Accreditation Teams, 1991; Executive Board, Council for Research Policy and Graduate Education, National Association of Schools, Universities, and Land Grant Colleges (NASULGC), 1991–; Federal Relations Task Force, Council for Research Policy and Graduate Education, National Association of Schools, Universities, and Land Grant Colleges (NASULGC), 1991–; Program Committee, Western Association of Graduate Schools (WAGS), 1990–; Planning Committee, Northern California, American Council on Education, National Identification Program (ACE/NIP), 1991–; Executive Committee, Western Association of Graduate Schools (WAGS), 1993–; Member, Graduate Record Examinations Board (GRE), 1993; and SIPh.D. Review Committee, University of Washington, 1993.

Honors and awards: Vassar College, A.B., Summa cum laude, 1968 Biology; Institute of Medicine1National Academy of Sciences, elected 1992; Doctor of Humane Letters, Mount Saint Mary College, Newburgh, NY, May, 1989; Endowed Chair—John Guy Vassar Chair for Natural Sciences 1986–89; 1982 American Institute of Nutrition (AIN) Award in Experimental Nutrition (BioServ Award); NIH Research Career Development Award, 1978–83; Mellon Scholar-in-Residence, St. Olaf College, Northfield, MN, January, 1978; NIH Postdoctoral Fellowship, 1974; Matheson Postdoctoral Fellowship, 1973–74; New York State Regents Fellowship for Graduate Study, 1968; Phi Kappa Phi; Prytanean Society (Honorary Member); and Sigma Xi.

Published writings: The list of the many articles and abstracts may be found in the committee files.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY DR. GREENWOOD

Question. If confirmed as an Associate Director of the Office of Science and Technology Policy (OSTF), what will be your principal responsibilities and activities? Also, what will be your two or thee highest priorities?

Answer. If confirmed as the Associate Director for Science, my principal overall responsibilities will be to provide the Director of the Office of Science and Technology Policy and other offices in the Executive Office of the President—such as the Office of Management and Budget and the National Economic Council—with information, analysis, and advice on a broad array of scientific issues. The range of issues is diverse since the Science Directorate will encompass the life sciences, the physical sciences and engineering, mathematics, as well as the social and behavioral scieices. In addition to the specific scientific issues, there remain an extensive number of issues including the state of research facilities at universities, science and mathematics education, effectiveness of research management, and the overall level of our investment in fundamental research.

Related to the above, I expect to play a major role in helping to guide and formulate policies related to scientific research supported by the federal government. This would be done by participating in the evaluation of the budgets of various agencies, setting priorities, and coordinating the combination of national and international research with aspects of private sector research. Specifically, this would include working with interagency groups and organizations to coordinate the research programs of the National Science Foundation, the National Institutes of Health, and other agencies and departments.

My overall responsibility would be aimed at achieving the goals of highly effective management of the federal research enterprise and assuring that the U.S. maintains global leadership in science, mathematics, and engineering in fields important to broad national objectives in the areas of our economy, health and quality of life, energy and the environment, and national security.

In carrying out my overall responsibility, my highest priorities will include: (1) Helping to develop and implement a sustainable non partisan framework for evaluating, assessing, and establishing funding priorities for our nation's research in cooperation with the various agencies; (2) Helping to clarify the respective roles and relationships between fundamental science, transitional science, and technology in supporting the achievement of various national goals; and (3) Working to develop choices for the kinds and levels of investment in the intellectual capital of our nation—including science support and science and mathematics education.

Question. In general, what will be the division of responsibility between you and other Associate Directors? For example, while Mr. Johns has the lead in space matters, will you have the lead in space science matters?

Answer. Rather than having a single Associate Director as the "lead" for space issues, OSTP's development and coordination of space policies and programs will be managed by the four Associate Directors acting as a team, with each Associate Director bringing their specific expertise to bear on various technology, science, environment, and international issues as appropriate. The Assistant Director for Space at OSTP will serve as the point of contact and point of coordination between the four Associate Directors, to ensure the development of integrated space policies.

I would expect to play a substantial role in space science matters as part of our integrated approach in dealing with the space area. It happens also to be an area where science and technology are closely connected and strongly influence each other. Assuring a vigorous program in fundamental space research will be an important responsibility for me as also discussed in the later answers to questions.

Question. If confirmed, what role will you play in interagency science programs and initiatives? In particular, what role might you play in the interagency initiatives in advanced materials and global change?

Answer. It is planned that there will be two new interagency groups dealing with fundamental research: one will focus on generic matters (e.g., overall renewal of facilities, conflict of interest, etc.); a second will consider priorities for fundamental scientific and engineering research. Since a number of science-supporting agencies will be involved in both the advanced materials and global change interagency programs, I would expect to be involved as part of assuring the maintenance and improvement of a strong science base and the appropriate linkages of science with policy choices. All of these efforts would be geared to developing comprehensive, balanced, and effective programs that serve national and global objectives.

Question. The February 22, 1993, technology policy statement issued by the President and Vice President contains the following statement: "In 1993, the civilian share of the total federal R&D budget was approximately 41 percent. Under President Clinton's plan, the civilian share will be more than 50 percent by 1998." (page 8) In your view, what are the implications of this policy for Federal support of Administration priorities in science? For example, does it imply increases for civilian science programs such as those of the National Science Foundation (NSF) and the National Institutes of Health (NIH) and less for more defense-related sciences such as certain fields of physics?

Answer. The implications of the above statement are clearly to focus our national research and development on post cold war issues. As we move toward defense conversion and defense diversification we will need to connect our research enterprise to economic competitiveness and global concerns such as preservation of our planet. At this time, the early shifts toward the long-term goal have been in technology areas such as some reductions in defense technology programs and some increases in Commerce programs—as you know. Longer term strategies require that we formulate a sustainable non partisan approach and extended commitments to new missions. This new approach may well imply that areas of research both fundamental and developmental that show promise for wealth creation and application to problem solution, and the agencies associated, may benefit from additional investment. However, in my opinion, suggestion of automatic cuts for some defense-related sciences such as certain fields of physics may be premature until priorities and options have been developed. It will be important for us to maintain a healthy defense science and technology base both for national security purposes and contributions to our economic growth. Finally, to return to the answer for question 1, a major concern of mine, if confirmed, will be to help establish a proposed new framework for evaluating, assessing, and establishing funding priorities for the research supporting agencies and to provide guidelines for dealing with priority issues such as those raised in this question.

Question. As the Cold War recedes, and as economic needs loom larger, a debate has begun over how to make science programs at NSF and other agencies more useful to meeting current national needs. What are your current views on this issue? For example, how do you think that Federal support for university research can be made more useful to industry?

Answer. It is my view that the science programs of the various federal agencies should be related to national needs and goals quite broadly—but that the degree of relationship and connection will vary tremendously by field and purpose of the research. Depending on the field of science, one important function or purpose of research is to be generally useful to industry and to add to the knowledge base that aids the United States in sustaining and increasing economic competitiveness. Nonetheless there are critical questions to be asked regarding the time frame and the mechanisms that are most effective.

There is ample evidence that some in industry have found university and laboratory research to be very valuable and have been willing to support this work with their own money. In addition, industrial participants in national studies often speak about the critical importance of the federal commitment to knowledge creation and fundamental discovery to the long term health of our nation. I think it would be a mistake to make radical changes in the Federal Support of science to require that it be directly responsive to industrial needs. There is little evidence to suggest that major problems in U.S. competitiveness are caused by a lack of university responsiveness to industrial needs. Most commentators attribute the majority of the problems that have arisen in our national competitiveness to industrial strategies that focus on immediate gains. The new approaches to knowledge and technology transfer that are emerging at this time in our history may well resolve some of these difficulties.

An important product of the university research system and federal support is the large number of highly trained and skilled individuals who leave universities for employment in the private sector. The rapidly growing biotechnology industry is just one example of this special feature of U.S. education and federal support.

But to return to the main thesis of the question, I agree that more consideration can and should be devoted to determining how best to align our research priorities with important national needs—including those of industry. That is a subject that the Clinton Administration, and I—if confirmed—will spend much time on in the future, including working with you in Congress.

Question. In the wake of Congress' decision to terminate the Superconducting Super Collider, what are the Administration's plans regarding the future of Federal support of physics research? What research is needed in the Post-Cold War era, and what opportunities now exist for international collaboration?

Answer. This is a subject to which I will give much attention in the months ahead. As I noted in the answer to question 1, one of my very highest priorities will be helping to put into place a framework for addressing these kinds of important issues. However, I think it extraordinarily important for us to examine the unfolding of the SSC issue for "lessons to be learned" on how best to plan, develop, fund, and manage these large-scale science projects in the context of a long-term science policy. In the near term I understand that the administration will be developing a plan to provide an orderly termination of the project. As part of this plan, OSTP will be working with DOE and experts in the field of high energy physics to examine our opportunities for future work, especially in international collaborative settings. High energy physics continues to contribute to such critical fields as telecommunications and high performance computing and we need to be cautious not to downsize an area of research in which there is much international competition without careful planning.

Question. As budget pressures increase at the National Aeronautics and Space Administration, how will the Administration balance funding between space science, the Space Station, and operational systems such as the Space Shuttle?

Answer. The budget pressures at NASA are indeed being felt intensely and difficult choices are thereby occurring. Once again, we must view the issue raised by the committee as part of the larger issue of balancing a portfolio of research and development. The Space station and the space shuttle are projects that have received high priority over time and represent operations aspects of NASA's mission. These are aspects of NASA's mission that are not easily done by ether agencies. Nonetheless, other aspects of NASA's work may have long term as yet less defined outcomes that will become increasingly important to us as we face the 21st century. I am not prepared at this time to be specific about line item issues within an agency budget but I would hope to play a role in aiding the agency as it works out its priorities with others within the interagency coordination process.

Question. Administration support for a Space Station rests largely on the unique scientific benefits that may be derived from a microgravity environment. How will the Administration ensure that investment in NASA's life sciences and microgravity sciences is the best use of our Nation's scant science funding?

Answer. The Administration supports the Space Station program not only as an important science and technology investment for the United States but also as a symbol of peaceful international cooperation in the exploration of space. But in addressing the space science balance and "best use" questions, I would first observe that in the established traditions of scientific inquiry, space flight—including the shuttle and the Space Station—provides a unique laboratory that allows scientists to investigate the fundamental states of matter—solids, liquids, and gases—in low gravity.

Low gravity, or microgravity, results from the continuous free fall experienced by spacecraft in orbit. Scientists use this microgravity environment to isolate and control gravity-related phenomena and to investigate biological and other phenomena and processes that are difficult or impossible to study on Earth. Low gravity can also be achieved on Earth but only for short periods of time, thence limiting researchers in performing ground-based microgravity research.

The NASA life sciences and microgravity work are a part of the overall NASA space science program which, in turn, is related to research work being supported by other agencies such as the NIH, the NSF, the Department of Defense, the Department of Energy, and others. I expect to place a high level of attention, as I stated in my previous answer, to the matter of evaluating, assessing and establishing funding priorities for the various research supporting agencies. At this point in my history I am not sufficiently familiar with all of the specific scientific issues, therefore, I cannot personally assure you that NASA's proposed investment in life sciences and microgravity are the best use of our nation's scant science funding but I can assure that I will work to insure that all of the science that is conducted in association with the space station will be subject to high quality review and prioritization and will be state of the art and relevant.

Question. Federal research at NIH and the Department of Agriculture (USDA) have helped to create a major U.S. biotechnology industry. Do You believe that any other Federal steps are necessary or appropriate to help this important American industry?

Answer. I agree that Federal dollars, through NIH and USDA, are in many ways responsible for the current vitality of our domestic biotechnology industry. There are a number of illustrations of this success, in both the biomedical and agricultural arenas. Nevertheless, I believe we face a critical juncture as companies in this country struggle to develop long-term competitive strategies.

New biotechnology applications across many industrial sectors rely heavily on a strong science foundation. Future advances will be based on fundamental knowledge developed today and brought to fruition by scientists and engineers being trained at this moment. We need to ensure a continuously replenished cadre of highly skilled workers for the biotechnology industry of the future, as well as for training the next generation of scientific investigators.

While a healthy research base fuels innovation at its earliest stages, it is just as critical that product development not be restricted at later points on the commercialization continuum. At Davis, I had the opportunity to observe many agricultural biotechnology companies which have been established in the area surrounding the university. These firms rely on venture capital to support their R&D (and production start-up) and are having a difficult time mailing ends meet. Many of their concerns, however, are not unique to biotechnology but are common to all emerging industries, particularly those in the high-tech arena. The President's Technology statement addresses many of these issues: availability of capital, R&D tax credit, etc.

I intend to focus on learning other ways in which the Federal Government could assist the biotechnology industry so that its promise can be realized and the public investment in biological research returned. This is an area that will be a priority concern to me.

Senator ROCKEFELLER. Dr. Greenwood, that was nice.

Also as I now turn to Ms. Wales, I believe that both you and Dr. Watson have family members here. And if that is the case, we would love to have them introduced.

Ms. WALES. Yes. My mother and stepfather, Helen and Harry Hall.

Senator ROCKEFELLER. Well, point them out. [Laughter.]

Ms. WALES. Are sitting with my sister-in-law, my brother's wife, Jeannie Anderson.

Senator ROCKEFELLER. Good. Well, we welcome them.

Ms. WALES. And I am sorry to say my husband could not be here today because he is a career civil servant, a trial attorney who is taking depositions in Mobile right as we speak. [Laughter.]

Dr. WATSON. Yes. I would like to introduce my wife, Elizabeth.

Senator ROCKEFELLER. We welcome you, Mrs. Watson, very much. Ms. Wales, please go ahead.

STATEMENT OF JANE M. WALES, ASSOCIATE DIRECTOR-DESIGNATE, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Ms. WALES. Thank you. I welcome the opportunity to appear before you as the President's nominee to be Associate Director for National Security and International Affairs in the Office of Science and Technology Policy. If confirmed, I will have the honor of working with the President and his science advisor, Jack Gibbons, and of working with you to ensure that science and technology are put to the service of our Nation's security and prosperity.

If confirmed, I will be appointed jointly to OSTP and the National Security Council staff, and through this dual appointment will seek to ensure that the best scientific knowledge is brought to bear on matters of national security concern. In carrying out these duties I will seek your counsel, during a period in which the United States is facing a number of pressing security problems which demand effective action based on sound scientific and technical analysis, as well as sensible politics.

We must simultaneously manage the downsizing of our military forces and underlying industries. We must strengthen our efforts to prevent the proliferation of advanced weapons. We must work to integrate former foes into the industrialized world, while at the same time we work to reinvigorate our own economy on the understanding that our security will derive from our economic standing in the world.

As a conduit of scientific information and analysis, I hope to provide the underpinnings for sound policy judgment. As a foundation officer, I have had the privilege of working with some of the most talented scientists doing policy-relevant research, and I hope to build on that experience and tap their expertise as I pursue this agenda.

I have also gained from the deliberations of the Carnegie Commission on Science and Technology in Government, whose executive director, David Robinson, sits in the audience. That Commission has had a lot to say about the importance of S&T expertise in Government decisionmaking, and I take it to heart.

I will use the skills I developed as a journalist and as a writer to try to synthesize and candidly report broadly sourced opinion and analysis. And using my experience in both the executive and legislative branches of Government—in the Senate and the White House and the State Department—I will work with experts across agency lines to try to translate this analysis into practical policy options.

In recent years I have chaired the Cooperative Security Program at Carnegie Corp., as you mentioned. There, corporation president, David Hamburg, has always urged me to take on seemingly intractable policy problems. I have always appreciated his guidance to me, which tends to come from Mark Twain. What he says is "Get the facts straight and let others do with them what they may."

Senator ROCKEFELLER. David Hamburg is an extraordinary foundation executive.

Ms. WALES. He is, indeed.

Senator ROCKEFELLER. He has been a big factor in my life too.

Ms. WALES. Mr. Chairman I believe, above all, it will be my job to follow his guidance on this score and get the facts straight.

Senator ROCKEFELLER. Well, do not forget Dr. Gibbons. He will be important too. [Laughter.]

Ms. WALES. I find Dr. Gibbons relies heavily on Mark Twain also.

But I take seriously the challenges of this position, for while the superpower confrontation has ended, the world remains an exceedingly dangerous place. Threats to larger nations, such as ours, might be less apparent and less direct, but threats to smaller nations have grown. And the contagion of violence continues to spread.

In such an unpredictable and conflict-ridden world, the U.S. military must remain unsurpassed.

While we downsize our forces, we need to renew and strengthen our commitment to halting, and if necessary, countering the proliferation of advanced weapons. We will need to be at the cutting edge of both technology and diplomacy as we seek international agreements to improve our access to knowledge, to technology, and to markets around the world.

Today's news, reminds us that we face a very difficult task in encouraging the safe dismantlement of former Soviet nuclear forces, and the disposal of the fissionable materials they contain. Among the first grants I made at Carnegie were for a series of studies on the disposition of nuclear weapons in what was then the Soviet Union. By the time of the August 1991 coup, university scholars were able to pinpoint the whereabouts of nuclear weapons and describe both the logistics and the finances of dismantling them.

I now look forward to working within government to help implement the Nunn-Lugar legislation informed by this scholarly enterprise.

While the demilitarization of the former Soviet Union is a difficult diplomatic task, we face a much more vexing technical problem. And that is the effort to safely dispose of weapons-grade plutonium. I think there is well over 100 metric tons in Russia and 100 metric tons in the United States.

I know that Congress has foreseen this problem and has called for a series of studies on the issue, which we will take into account.

As complicated as it is to place effective controls on nuclear weapons and their materials in post-Soviet states, the more daunting task is the conversion of the Soviet military industrial complex to civilian pursuit. Foreseeing this need at Carnegie, we supported the work of Stanford University, which collaborated with American defense industries to convert 10 Russian defense enterprises. This was a modest, but necessary, start.

When Vice President Gore met with Prime Minister Chernomyrdin, he made defense conversion a priority. I hope to contribute to that effort.

Part of the collaboration between the United States and Russia under the Gore-Chernomyrdin Commission will be an effort to complete the negotiation of the first U.S.-Russian S&T umbrella agreement that Dr. Gibbons will be overseeing. This agreement would provide access for our scientists to a great wealth of talent, information, and facilities, and would help provide their scientists the will and the means to contribute to the transformation of their economy and political system.

While S&T agreements such as these contribute to strategic aims, such as economic development and political stabilization, their most important objective is to promote American scientific knowledge and to gain access to the technological benefits that derive from that knowledge.

Our approach to cooperative agreements, be they S&T agreements or trade pacts, should reflect the Government's commitment to growing the economy and increasing our competitive standing around the world.

Finally, Mr. Chairman, I know that in an era of constrained budgets and otherwise boundless scientific opportunity, our Nation will need to join with others to share in the cost and the management of large projects, be they scientific or technical. It will be my task to seek international partners, and build the basis for collaboration and cost sharing.

But there is a prior obligation. And that is to work with you, with the scientific community, and across Federal agency lines, to set clear priorities for international S&T investment. I intend to do so, working through an interagency structure. And through a reinvigorated President's Council of Advisors on Science and Technology, I will reach out to scientists and engineers for their guidance along the way.

Most importantly, I will work closely with you and your colleagues to ensure that S&T priorities are based on the national interest.

Thank you.

[The prepared statement, biographical data, and questions and answers of Ms. Wales follow:]

Prepared Statement of Jane Wales

I welcome this opportunity to appear before you as President Clinton's nominee to be Associate Director for National Security and International Affairs in the Office of Science and Technology Policy. If confirmed, I will have the honor of serving the President and his Science Advisor, Dr. John Gibbons, and of working with you to ensure that science and technology are put to the service of our nation's security and prosperity.

As a conduit of scientific information and analysis I will seek to ensure that the best scientific knowledge is brought to bear on issues of national security concern. I will seek your counsel during this period in which the United States faces pressing security problems demanding effective action based on sound analysis. We must:

- manage the restructuring of our military forces and associated industries;
- strengthen efforts to prevent the proliferation of advanced weapons and the means of their delivery;
- work to integrate formerly communist nations into the industrialized world; and
- reinvigorate our economy—for our security as a nation will derive in large measure from our global economic strength.

I take seriously the challenges of this position. For, while the superpower confrontation has ended, the world remains a dangerous place. Threats to larger nations such as ours may be less direct or less apparent, but threats to smaller nations have grown, and the contagion of violence continues to spread. In this unpredictable and conflict-ridden world, the United States must remain militarily unsurpassed. While we downsize our military forces, we will need to renew and strengthen our commitment to halting and, when necessary, countering the proliferation of advanced weapons. We will need to be on the cutting edge of both technology and diplomacy as we seek international agreements to improve our access to knowledge and markets around the world.

Most immediately we face the task of encouraging the safe dismantlement of former Soviet nuclear weapons and the disposal of the fissionable materials they contain. Among the first grants I made at Carnegie were for a series of studies on the disposition of Soviet nuclear forces and the facilities for warhead production. By the time of the August 1991 coup, scholars were able to identify with precision the whereabouts of nuclear weapons and to describe the logistics and finances of dismantling them. I look forward to working within government to help implement the Nunn-Lugar legislation informed by this scholarly enterprise.

While the demilitarization of the former Soviet Union is a difficult diplomatic task, the most vexing technical problem we face is the need to safely dispose of over 100 tons of weapons grade plutonium in Russia and 100 more in the U.S. At Carnegie we supported the National Academy of Sciences Committee on International Security and Arms Control (CISAC). CISAC is conducting a study on plutonium disposition, which will be among the sources of OSTP's information and analysis, but not our sole source. The Congress anticipated this need and mandated other studies on the subject which will also help our nation tackle this post-cold war problem.

An equally daunting task is the conversion of the former Soviet military industrial complex to civilian pursuit. At Carnegie we supported the work of Stanford University's collaboration with American defense industries to convert 10 Russian defense enterprises. While modest, this effort was a necessary start. When Vice President Gore met with Prime Minister Chernomyrdin, he made defense conversion a priority in our broad cooperative relationship. Under the rubric of the Gore-Chernomyrdin Commission and its Defense Diversification Committee, I look forward to contributing to this important effort.

The problem of brain drain in the former Soviet Union remains a serious one. I therefore plan to vigorously pursue the establishment of science foundations in Russia and Ukraine and work to complete the negotiation of the first U.S.-Russia Science and Technology umbrella agreement. Such an agreement would provide access for our scientists to a great wealth of talent, information, and facilities, and would help provide their scientists the will and the means to contribute to the transformation of their political economy and system of government.

The fact that the U.S. has entered into over 600 S&T agreements with other nations demonstrates that science and technology have become important to our goals of promoting economic development and political stability abroad. However, we should be clear that although S&T agreements can contribute to these and other strategic aims, their most important objective is the promotion of American scientific knowledge and the technological benefits that derive from that knowledge. A great nation such as ours does not measure its security in military terms alone. Our approach to cooperative agreements—be they S&T agreements or trade pacts—should reflect the Administration's and Congress's commitment to growing the economy and increasing our competitive standing in the world.

There is no precedent for simultaneously achieving these objectives. New approaches will have to be agreed upon. The success of government will depend in part on nongovernmental efforts to generate new knowledge, to seed ideas through practical experimentation, and to build a leadership and public consensus on the range of options before us. Sound policy will be the product of an interaction among independent scholarship, commercial enterprise, and government leadership and the Office of Science and Technology Policy will have a distinct role to play. I would be honored to be part of this effort.

I come before you with no pretense that I am fully experienced in all of the issues and challenges presented to you today. But in many ways this position is the logical next step in my professional life.

As a journalist and writer, I became accustomed to dealing with new and ever-changing issues while synthesizing and candidly reporting broadly sourced opinion and analysis. As a staff member to former Senator Walter Mondale, I came to understand and to appreciate the demands placed on each of you to cover the full range of public policy questions on a daily basis. And from my service in the White House and State Department in the Carter Administration, I've gained an understanding of and appreciation for the interagency policymaking process.

As a foundation officer—at the Carnegie Corporation of New York and the W. Alton Jones Foundation—I have had the privilege of working with some of the nation's most talented scholars, analysts, and industrial leaders on research related to many items on our international agenda. I plan to continue to reach out to these talented scholars and entrepreneurs.

Mr. Chairman, as chair of the cooperative security program at Carnegie Corporation, I was encouraged to tackle a series of seemingly intractable problems. In dealing with these problems, Carnegie President David Hamburg's advice to me, which I understand originated with Mark Twain, was "to get the facts straight. Get the facts straight and let others do with them what they may."

Mr. Chairman, I believe it will be my job to get the facts straight. And this certainly will be the bedrock of my working relationships with Congress. You can count on this.

Thank you.

BIOGRAPHICAL DATA

Name: Wales, Jane; address: 3612 Davis Street, NW, Washington, DC 20007; business address: Carnegie Corp., 437 Madison Avenue, New York, NY 10022.

Position to which nominated: Associate Director for National Security and International Affairs; date of nomination: August 9, 1993.

Date of birth: July 24, 1948; place of birth: New York, NY.

Marital status: Married; full name of spouse: R(obert) Scott Blaze.

Education: Sarah Lawrence College, 9/66–6/70, B.A.

Employment: Current, Chair, Cooperative Security Program, Carnegie Corp.; 1988–90, Director, Secure Society Program, W. Alton Jones Foundation; 1982–8, Executive Director, Physicians for Social Responsibility; 1981–82, Associate Director, Committee for National Security; 1977–79, Coordinator, Public Liaison, the White House; 1976–77, Spokesperson, Carter-Mondale Transition Team; 1976, Press Secretary and Writer, Democratic National Platform Committee, Democratic National Committee; 1975–76, Deputy Press Secretary, Office of Senator Walter E. Mondale; 1974–75, Managing Editor, Democratic Review; 1972–75, Writer, Research Department, Congressional Quarterly, Inc.; 1971–72, Reporter, reviewer, editor, Park East; 1970–71, Reporter, columnist and women's editor, Virgin Islands Daily News; and Assisted Robert S. McNamara in the research and organization of "Out of the Cold" (Simon and Shuster, 1989).

Political affiliations: Occasional small contributions to the Democratic National Committee and individual congressional and Presidential campaigns.

Memberships: Member, Council on Foreign Relations since 1990; and Member, National Governing Board of Common Cause since 1990.

Honors and awards: Regents Scholarship, 1966.

Published writings: Assisted in 1989 book with Robert S. McNamara, author; 1988 op-ed in NY Times; and 1988 article in the Bulletin of Atomic Scientists.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY MS. WALES

Question. If you are confirmed as an Associate Director of the Office of Science and Technology Policy (OSTP), what will be your principal responsibilities and activities? What will be your highest priorities?

Answer. The National Security and International Affairs Directorate represents a merger of two previously separate areas of responsibility within OSTP: the science and technology aspects of national security policy and the promotion and management of international science and technology cooperation. If confirmed, it will be my responsibility to ensure the best scientific and technical knowledge is brought to bear on issues of national security concern. Furthermore, it will be my task to promote bilateral science and technology cooperation, to seek international partners in large-scale science and technology projects, and to participate in interagency processes to ensure that federal science and technology investments are put to the service of our nation's security and prosperity.

Most immediately, the national security portfolio will include co-chairing or otherwise participating in interagency efforts to implement the technical aspects of the President's nonproliferation initiative. This includes an interagency study on the disposition of plutonium from dismantled warheads in the United States and the former Soviet Union, an ongoing review of U.S. export control policies, and the development of policy options for containing the spread of advanced conventional weapons. In addition, it will include an interagency effort to ensure that the U.S. Government has fully developed its options for monitoring and, if necessary, countering proliferation once it occurs. Finally, I will be responsible for ensuring that the Director of OSTP can carry out his responsibilities to the President to advise on initiating, restoring, and reconstituting the nation's telecommunications resources in the event of a national emergency.

Because of the immediate proliferation threat posed by the state-breaking, state-making process in the former Soviet sphere, my office will assist U.S. Government efforts to ensure the safe dismantlement and destruction of former Soviet nuclear weapons, to encourage former Soviet weapons scientists and design teams to engage in civilian research, and to help former Soviet defense industries convert to civilian enterprises. Accordingly, at Dr. Gibbons' request, I will coordinate OSTP's role in the Gore-Chernomyrdin Commission, which includes cooperative efforts in the areas of defense diversification, energy, environment, space, business development, and science and technology. Dr. Gibbons is the U.S. chair of the Science and Technology Committee of the Gore-Chernomyrdin Commission.

Cooperation in science and technology often serves U.S. strategic objectives, as is the case with the U.S.-Russian umbrella agreement. But its fundamental purpose is to provide U.S. scientists access to knowledge and the technology that flows from that knowledge. I plan to work to ensure that the bilateral and multilateral science and technology agreements we pursue contribute to expanding our knowledge base, to strengthening our economy, and to improving Our competitive standing. Finally, I will work through the FCCSBT structure, the OECD Megascience Forum (on which I will serve as Vice President) and in consultation with Congress on establishing priorities for large-scale international science and technology projects.

Question. In general, what will be the division of responsibilities between you, if confirmed, and the other Associate Directors? For example, will you participate in U.S.-Russian space negotiations? To what extent would you be involved in issues relating to international collaboration with respect to global environmental monitoring?

Answer. Rather than having a single Associate Director lead OSTP activities in the space field, OSTP's development and coordination of space policies and programs will be managed by the four Associate Directors acting as a team, with each Associate Director bringing his or her specific expertise to bear on various technology, science, environment and international issues, as appropriate. The Assistant Director for Space at OSTP will serve as the point of contact and point of coordination among the four Associate Directors, to ensure the development of integrated space policies.

Therefore, while the Technology Directorate worked with NASA on its redesign of the space station,I expect that once I am confirmed, I will share responsibility for bilateral and multilateral arrangements for the planning, financing, and management of space station. I will also work on issues such as excess ballistic missiles and the convergence of NASA, NOAA and DOD meteorological satellite systems with other Associate Directors.

Question. In the previous administration, the associate director who handled international affairs also was responsible for science and engineering education. If confirmed, do you expect that you will be responsible for these education issues? If not, who at OSTP will handle these issues?

Answer. With the collapsing of responsibilities for national security and international science and technology into one directorate, a decision was made to shift responsibilities for science and engineering education to the Technology Directorate and the newly formed Science Directorate.

Question. If confirmed, what role do you expect to play in overall national security policy? For example, do you expect to devote attention to questions of weapons proliferation? Will you become involved in export control issues? In what other areas of national security do you expect to participate?

Answer. In recognition of the importance of science and technology to national security planning and programs, if confirmed, I will be jointly appointed to the OSTP and National Security Council staffs. Through this joint appointment, I will be charged with ensuring coordination between OSTP and the NSC staff. Secondly, through interagency committees and working groups, I will have responsibility for helping to set priorities for federal investments relating to national security and arms control. Third, working with my colleagues on the NSC, I will serve as a conduit of science and technical information and analysis on such issues as nonproliferation policy, export controls, the role of nuclear weapons, and the future use of intelligence assets. These are among the likely topics to be on my agenda. My current priorities in the national security arena are listed in my answer to question number one.

Question. If confirmed, what role do you expect to play in interagency science programs and initiatives? In particular, what role might you play in the interagency global change program or the international aspects of initiatives in such areas as manufacturing and advanced materials?

Answer. Interagency coordination in science and technology is critical to virtually all aspects of my job as Associate Director. I will help lead an interagency group on international science and technology which will be the primary interagency forum for setting priorities for international S&T investments. Furthermore, I will have primary responsibility within OSTP for coordinating U.S.-Russian cooperative programs under the Gore-Chernomyrdin Commission, and as Vice President of the Organization for Economic Cooperation and Development (OECD) Megascience Forum, I will have responsibility for helping to set priorities among industrialized states for joint S&T projects and programs. I will collaborate on a number of crosscutting issues including global change (with the Associate Director of Environment), international cooperative initiatives in areas such as manufacturing or advanced materials (with the Associate Directors of Science and of Technology, respectively) and remote sensing (with the Associate Director of Environment). Finally, I will lead or co-chair, as appropriate, interagency working groups on specific S&T questions, including the disposition of plutonium, joint use of satellites for military and civil purposes and disposition of excess ballistic missiles.

Question. What do you believe should be the U.S. science and technology priorities regarding Japan?

Answer. One of my responsibilities is to oversee the Agreement Between the United States and Japan on Cooperation in Research and Development in Science and Technology, as revised in 1988. The agreement calls for "equitable contributions and comparable access to each Government's research and development systems," and I will seek to foster this cooperative spirit for U.S.-Japanese science and technology activities. We have much to learn from the Japanese in the area of science and technology, as they have from us. There are many areas of basic science where cooperative research can serve mutual interests—high energy physics, geology, environmental modeling, and many ether areas.

At the same time, I will be watchful to ensure that the taxpayer's dollars are not used to encourage business practices that create jobs primarily outside the United States. Basic institutional asymmetries also need to be considered: the best Japanese R&D resides in private companies, while ours resides in our comparatively open universities and publicly-funded government R&D centers, as well as in U.S. companies. OSTP will need to work closely with the Congress and key Federal agencies, especially the Departments of Commerce and Defense, to develop a satisfactory approach.

Question. Do you believe that it is in the interest of the United States for its companies and perhaps also its government research agencies to invest heavily in international projects such as Intelligent Manufacturing Systems? If so, what are the conditions or ground rules under which such investment is in the U.S. interest?

Answer. The general principle laid down in the 1988 Science and Technology Agreement is "equitable contributions and comparable access." Of course, generalities do not solve the problem; detailed planning of individual projects is necessary. I do believe it is possible for us to cooperate productively with the Japanese in carefully selected and planned projects in which they.have as much to offer as we do and where there are mutually derived benefits. This is especially likely to prove true in fields with a large element of public good; for example, environmentally benign, sustainable, and economically efficient production processes.

Question. In general, do you believe that foreign-owned companies should be eligible to participate in government-assisted research programs such as the clear car initiative? If so, under what conditions should they be allowed to participate?

Answer. This question may have to be answered on a case-by-case basis. U.S. Government policy so far has differed in different programs. The solution for the Commerce Department's Advanced Technology Program, worked out by this committee in cooperation with industry, requires all participating countries to have a substantial manufacturing and R&D presence in the United States; in addition, for foreign-owned companies, it requires reciprocal access in the home country to government-sponsored R&D programs, plus other requirements such as adequate intellectual property protection. On the other hand, Sematech has not allowed foreign participation. The problem seems especially acute in the case of the Japanese, because of the difficulties of getting comparable access to their R&D programs. Again, we will need to work closely with the Congress and appropriate Federal agencies to develop policies for federally-subsidized applied research in this and other areas.

Question. The U.S. and Russia are exploring possible collaborations in space, energy, and aeronautics, all Of which are high-technology areas. How will U.S. science, technology and industry benefit from these collaborations?

Answer. The Russians have developed significant capabilities and experience in the areas of space, aeronautics and energy. By working with the Russians, the United States would be able to gain greater insight into related technologies and practical applications. For example, in the area of space, the United States would benefit from Russia's expertise in rendezvous and docking technologies, space suit technologies, closed life support systems and solar dynamic power. In aeronautics, the Russians have developed advanced systems and technologies using alternate and often more effective approaches. Thermal protection systems, composite structures and materials and R&D efforts involving scramjet technology are examples where bilateral cooperation would be advantageous to the United States. In the field of energy, joint production and marketing ventures between U.S. companies and Russian entities could allow U.S. companies access to the Russian domestic market.

From a broader perspective, enhancing our cooperation with the former Soviet Union in these areas supports Russian and Ukrainian defense diversification and transformation to a market-based economy. Through industry-to-industry joint ventures and enhanced government-to-government contacts, we can have a positive influence on the process of market reform and economic stabilization in the former Soviet Union. In my view, these investments have the potential of yielding significant returns for the United States in the form of new markets and resource opportunities in energy (gas and oil), aeronautics and space as well as providing the basis for more stable cooperative relations.

Question. The U.S. commercial launch industry has been frustrated by the bilateral executive agreements between the U.S. and countries with non-market economies, such as the People's Republic of China and Russia. How should the Administration balance its foreign policy objectives with the impact on U.S. high technology industries?

Answer. The Clinton Administration is committed to advancing U.S. technological competitiveness as well as achieving foreign policy objectives such as strengthening nonproliferation regimes. In the case of the commercial launch services market, the United States has sought to develop an even-handed approach.

The recent space launch trade agreement with Russia incorporates a pricing mechanism that will safeguard against unfair pricing practices and a reasonable quota will provide the Russians access to the international market. In addition, the U.S.-Russian agreement will help the U.S. space launch industry adapt to post-Cold War conditions by providing a stable and predictable framework for Russian entry into the commercial space launch market. At the same time, it provides the U.S. satellite industry with access to Russian launch capabilities, thus avoiding broad restrictions that might put them at a commercial disadvantage.

China's actions regarding missile proliferation has had a significant impact on its ability to provide commercial space launch services on the world market. Recently-imposed missile sanctions, while underscoring the U.S. commitment to nonproliferation, prohibit the export of U.S.-manufactured satellites to China.

Senator ROCKEFELLER. Thank you very much, Ms. Wales. Dr. Watson, we welcome your words.

STATEMENT OF ROBERT T. WATSON, Ph.D., ASSOCIATE DIRECTOR-DESIGNATE, OFFICE OF SCIENCE AND TECHNOLOGY POLICY

Dr. WATSON. Mr. Chairman, Senator Burns, it is a pleasure and honor for me to appear before you today for the confirmation hearings for my nomination by President Clinton for the position of Associate Director for the Environment at OSTP.

I eagerly await the challenges that lie ahead, if confirmed, in working to implement the President's visionary plans for a cleaner environment, while enhancing the opportunities for economic growth and job creation, and positioning American industry to win in the global market.

In addition, I look forward to working with Members of Congress to fill the mandates of Congress, and assure you that I will carry out my duties to the best of my abilities.

Mr. Chairman, because of the dramatic rise in world population and industrial activity during the last century, human activities are affecting the environment at all geographic scales, from local, to regional, to global. Issues such as ozone depletion, global climate change, loss of biological diversity, poor water quality, and land degradation are interrelated, and are no longer the sole concern of the scientific community and environmentalists, but their importance has now been recognized by the private sector and governments around the world.

Sound national and international environmental policies must be based on a solid foundation of scientific, technical and economic understanding of the relevant facts. This understanding will allow us to protect our environment while strengthening our economy and industrial competitiveness.

As we move into the 21st century, the market for environmental technologies, both in developed and developing countries, will be expanded. This is a business opportunity that U.S. industry must not waste.

If confirmed as Associate Director for Environment, I would be responsible for providing the Director of OSTP and others offices in the Executive Office of the President with scientific and technical analysis and advice on a full range of issues associated with environmental policy. The range of environmental issues is diverse. It encompasses global issues, such as ozone depletion and climate change, loss of biological diversity, desertification, and deforestation, to the more local and regional issues, such as urban and rural air pollution, loss of wetlands, soil erosion, pesticides and toxic substances, water quality, and hazardous and solid waste disposal.

In addition, the environment directorate would play a major role in guiding Federal environmental research, setting research priorities, developing research programs, evaluating the budgets of these activities, and coordinating national and international governmental and private sector research.

These activities will include converging the Department of Defense, NOAA, and NASA meteorological satellite systems. The directorate will also be responsible for promoting and developing programs in environmental education and environmental technologies.

In addition, the environment directorate will be responsible for helping to develop analytical tools for policy formulation, such as integrated models and approaches to assessing and managing risk. Other activities will involve integrating policy considerations with respect to environment, energy, and economics. These activities will require frequent interactions with other offices of the Executive Office of the President, including the Office of Environmental Policy, the Council of Economic Advisors, and the National Economic Council, the Congress, Federal agencies, universities, and also the private sector.

I believe that my experience and qualifications as a research scientist at CalTech, a scientific manager in Government, for NASA, the chairman and/or the cochairman of major international assessments on the science, technology, and economics of ozone depletion, global warming, and biological diversity, my experience as the chairman of the World Bank, UNDP and UNEP Scientific and Technical Advisory Panel of the Global Environmental Facility, and the advisor to U.S. delegations to negotiate conventions and protocols on global warming and ozone depletion are the required background for proactive leadership in the position of the Associate Director for the Environment at OSTP.

Once again, I would like to say how much of an honor it is to meet with you this morning. And, if confirmed, I look forward to meeting with you and other Members of Congress in implementing the President's visionary policies for improving the environment and strengthening the economy.

Thank you.

[The prepared statement, biographical data, and questions and answers of Dr. Watson follow:]

PREPARED STATEMENT OF ROBERT T. WATSON

It is a pleasure and honor for me to appear before you today for the confirmation hearings for my nomination by President Clinton for the position of Associate Director for the Environment at the Office of Science and Technology Policy. I eagerly await the challenges that lie ahead if confirmed, in working to help implement the President's visionary plans for a cleaner environment while enhancing the opportunities for economic growth and job creation, and positioning American industry to win in the global market. In addition, I look forward to working with Members of Congress to fulfill the mandates of Congress, and assure you that I will carry out my duties to the best of my abilities.

As Associate Director of the Environment I would be responsible for providing the Director of OSTP and other offices in the Executive Office of the President with scientific and technical analyses and advice on the full range of issues associated with environmental policy. The range of important environmental issues is diverse and encompasses global issues such as ozone depletion, climate change (global warming), loss of biological diversity, desertification, and deforestation, to more local to regional issues such as urban and rural air pollution, loss of wetlands, soil erosion, pesticides and toxic substances, water quality, marine pollution, and hazardous and solid waste disposal.

In addition, the directorate will play a major role in guiding federal environmental research, setting research priorities, developing research programs, evaluating the budgets of these activities, and coordinating national and international governmental and private sector research. This will include activities such as evaluating the viability of converging the Department of Defense, National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration meteorological satellite systems. The directorate is also responsible for promoting and developing programs in environmental education and environmental technologies, and for promoting and developing analytical tools for policy formulation such as integrated models and approaches to assessing and managing risk. Often activities of the directorate involve integrating policy considerations with respect to environment, energy, and economics. These activities will require frequent interactions with other offices in the Executive Office of the President including the Office of Environmental Policy, the Council of Economic Advisors, and the National Economic Council, Congress, the Federal agencies, universities and the private sector.

I believe that my experience and qualifications as a research scientist at the Jet Propulsion Laboratory, California Institute of Technology, a scientific manager in government (National Aeronautics and Space Administration), the chairman, co-chairman or lead author of major international scientific, technical and economic assessments (stratospheric ozone depletion, climate change, and biological diversity), the chairman of the World Bank, UNEP, and UNDP Scientific and Technical Advisory Panel of the Global Environmental Facility, and a scientific and technical advisor to U.S. delegations negotiating environmental Conventions and Protocols provides the required background for proactive leadership for the activities and functions of the Associate Director for the Environment at OSTP.

My experience as:

- a research scientist at the California Institute of Technology/Jet Propulsion Laboratory allows me to appreciate and understand the many challenges that face university and government laboratory scientists in their pursuit of academic excellence.
- a scientific manager in government, responsible for a $200 million per year multidisciplinary Earth science NASA program, taught me how to develop programmatic goals and set research priorities, and to coordinate NASA's research program with other domestic and international research programs, governmental, intergovernmental, and private sector.
- the NASA representative to the U.S. Global Change Research Program of, and as the chairman of the Assessment Working group of, the interagency Committee on Earth and Environmental Sciences, taught me how to develop an interagency research program by establishing multi-agency priorities and implementation plans.

- the chairman, co-chairman or lead author of numerous major international scientific, technical and economic assessments of ozone depletion, climate change, and biological diversity taught me the ability to develop a consensus on scientifically and politically complex and contentious issues, and understand the inter-relationships between science, technology, economics, and real-world politics.
- the chairman of the World Bank, UNEP, and UNDP Scientific and Technical Advisory Panel of the Global Environmental Facility taught me how these three international agencies operate, how developing countries establish their environmental and development priorities, how the GEF can evolve to be the single unitary financial mechanism for global environmental conventions, and how to develop an analytical framework to establish criteria and priorities for cost-effective project selection for four complex inter-related environmental issues, i.e., ozone depletion, mitigation of climate change, reduction in the loss of biological diversity, and the protection of international waters.
- a scientific and technical advisor to U.S. delegations negotiating environmental Conventions, i.e., Vienna Convention for the Protection of the Ozone Layer and its associated Montreal Protocol for Substances that Deplete the Ozone Layer, and the Convention on Climate Change, taught me how to translate complex scientific and technical information into a form suitable for policy formulation at both the national and international level.

Mr. Chairman, because of the dramatic rise in world population and industrial activities during the last century human activities are affecting the environment at all geographical scales from local to regional to global. Issues such as ozone depletion, global climate change, loss of biological diversity, poor water quality, and land degradation are interrelated, and are no longer the sole concern of the scientific community and environmentalists, but their importance has now been recognized by the private sector and governments around the world. Sound national and international environmental policies must be based on a solid foundation of scientific, technical and economic understanding of the relevant facts. This understanding will allow us to protect our environment while strengthening our economy and industrial competitiveness. As we move into the 21st century the market for environmental technologies, both in developed and developing countries, wilt be expanding. This is a business opportunity that U.S. industry must not waste.

Once again I would like to say how much of an honor it is to meet with you this morning, and if confirmed, look forward to working with you and other members of Congress in implementing the President's visionary policies for improving the environment and strengthening the economy.

BIOGRAPHICAL DATA

Name: Watson, Robert Tony; home address: 11224 Beach Mill Road, Great Falls, VA 22066; business address: Office of Science and Technology Policy, Room 494, Old Executive Office Building, Washington, DC 20506.

Position to which nominated: Associate Director; date of nomination: June 20, 1993.

Date of birth: March 21, 1948; place of birth: Romford, Essex, England.

Marital status: Married; full name of spouse: Elizabeth Festa Watson; names and ages of children: Sarah Marie Watson, daughter, 11; Jennifer Marie Gormley, step-daughter, 22; and Douglas Lawrence Gormley, step-son, 24.

Education: Beal Grammar School for Boys, Ilford, Essex, England, 10/59–7/66, 7 ordinary level, GCE's, 3 advanced level GCE's; Queen Mary College, London, E.1, England, 10/66–6/69, 1st class honors, B.Sc. in Chemistry; and Queen Mary College, London, E.1, England, 9/69–6/73, Ph.D. in Chemistry.

Employment: National Aeronautics and Space Administration Washington, D.C.; Acting Director, Science Division, and Chief Scientist—1993–present, Office of Mission to Planet Earth; Director, Process Studies Program Office—1990–93, Earth Science and Applications Division; Branch Chief for Upper Atmospheric Research and Tropospheric Chemistry Programs—1987–90, Earth Science and Applications Division; Acting Program Scientist (NASA)—1980–87 on detail to Earth Science and Applications Division from the Jet Propulsion Laboratory for Upper Atmosphere Research Program, Interdisciplinary Earth Science Research Program, and Global Habitability Initiative; Jet Propulsion Laboratory, Pasadena, CA, Research Scientist, 1980–87, Member of the Technical Staff, 1978–80, Senior Scientist, 1976–78; Postdoctoral Research Scientist (1974–76), University of Maryland, College Park, MD; and Postdoctoral Research Scientist (1973–74), University of California, Berkeley, CA.

Political affiliations: None.

Memberships: None at present. I was once a member of the American Chemical Society.

Honors and awards: American Association for the Advancement of Science Award for Scientific Freedom and Responsibility, 1993; American Meteorological Society Special Award "for notable efforts in organizing and conducting international assessments in ozone depletion and global change," 1993; National Academy of Sciences Award for Scientific Reviewing, 1992; Edward A. Flinn, III Award established to recognize individuals who personify the American Geophysical Union's motto of unselfish cooperation in research through their facilitating coordination and implementing activities, 1991 (first recipient); Designated member of UNEP's "The Global 500: The Roll of Honour for Environmental Achievement"; NASA Group Achievement Award (EOS), 1993; NASA Cooperative External Achievement Award, 1992; NASA Distinguished Service Medal, 1989; NASA Public Service Group Achievement Award, 1989; NASA Group Achievement Award, 1989; NASA OSSA, Edelson Award, 1987; NASA Public Service Group Achievement Award, 1986; NASA Exceptional Service Medal, 1983; London Educational Award for three years to attend London University, England, for undergraduate studies, 1966–69; Science Council Award for three and one half years for Ph.D. studies at London University, England, 1969–73; and Draper'1s Company Prize for Chemistry for being top graduating student of the year, 1969.

Published writings: Refereed Publications, Scientific Assessments and Reviews, and Major Conference Reports may be found in the committee files.

QUESTIONS ASKED BY SENATOR HOLLINGS AND ANSWERS THERETO BY DR. WATSON

Question. If confirmed as associate Director of the Office of Science and Technology (OSTP), what will be your principal responsibilities and activities? Also, what will be your two or three highest priorities?

Answer. As Associate Director of the Environment I would be responsible for providing the Director of OSTP and other offices in the Executive Office of the President with scientific and technical analyses and advice on the full range of issues associated with environmental policy. The range of important environmental issues is diverse and encompasses global issues such as ozone depletion, climate change (global warming), loss of biological diversity, desertification, and deforestation, to more local to regional issues such as urban and rural air pollution, loss of wetlands, soil erosion, pesticides and toxic substances, water quality, marine pollution, and hazardous and solid waste disposal.

In addition, I would play a major role in guiding federal environmental research, setting research priorities, developing research programs, evaluating the budgets of these activities, and coordinating national and international governmental and private sector research. This will include activities such as evaluating the viability of converging the Department of Defense, National Oceanic and Atmospheric Administration, and the National Aeronautics and Space Administration meteorological satellite systems into a single system. I would also be responsible for promoting and developing programs in environmental education and environmental technologies, and for promoting and developing analytical tools for policy formulation such as integrated models and approaches to assessing and managing risk. Many of the activities of the directorate will involve integrating policy considerations with respect to environment, energy, and economics, which will require frequent interactions with other offices in the Executive Office of the President including the Office of Environmental Policy, the Council of Economic Advisors, and the National Economic Council, Congress, the Federal agencies, universities and the private sector.

My highest priorities will be: (i) to develop and implement a framework for establishing priorities for funding federal R&D activities, i.e. develop an environmental R&D strategy; (ii) improve the overall quality of the federal R&D programs through a more rigorous peer-review system and by strengthening extramural funding; (iii) expand the scope of R&D for each key environmental issue to produce more balanced programs that are policy relevant; and (iv) to develop a science-policy assessment group that ensures that the needs of decision makers are clearly taken into consideration when developing the R&D programs.

Question. In general, what will be the division of responsibility between you and other Associate Directors? For example, while Mr. Johns generally has the lead in space matters will you oversee space environmental activities, such as the Earth Observing System? Will you or someone else oversee environmental technology issues?

Answer. The strength of OSTP is Dr. Gibbon's matrix management system, and the excellent rapport among his staff. In general I, and my staff, would have primary responsibility for all scientific and technical matters concerning the environment, as elucidated in the answer to question l, but we would work very closely with the other three directorates. In particular, we would interact with: (i) the technology directorate with respect to environmental technologies, and matters concerning energy; (ii) the science directorate with respect to basic science issues, agriculture, population, health, and risk assessment; and (iii) the national security and international affairs directorate with respect to environmental aspects of national security and to environment related bilateral and multilateral science and technology agreements.

Rather than having a single Associate Director as the "lead" for space issues, OSTP's development and coordination of space policies and programs will be managed by the four Associate Directors acting as a team, with each Associate Director bringing their specific expertise to bear on the various technology, science, environment, and international issues as appropriate. The Assistant Director for Space at OSTP will serve as the point of contact and point of coordination between the four Associate Directors, to ensure the development of integrated space policies. My areas of responsibility would include the NASA Mission to Planet Earth, hence the Earth Observing System and Landsat, and the convergence of the NASA, NOAA and DoD meteorological satellite systems.

Environmental technology development issues will be covered jointly by the environment and technology directorates.

Question. If confirmed, what role will you play in interagency science programs and initiatives? In particular, what role might you play in the interagency global change program?

Answer. I would plan to play a very active role in creating one interagency committee that will coordinate all federal environment and natural resource R&D activities and that will link science and policy. The major objectives of the Committee might include:

- Maintaining and improving a strong science base for environmental and natural resource issues
- Creating an assessment subcommittee to link science and policy
- Developing a balanced, comprehensive environmental and natural resources R&D program that provides the scientific and technical basis for national and international policymaking, including the global environmental Conventions (ozone, climate and biodiversity) and Agenda 21.
- Strengthening research on: (i) the socioeconomic aspects of environmental changes; (ii) the impacts of, and adaptation to, environmental changes; and (iii) the mitigation of environmental changes.
- Improving the way that the federal government plans and coordinates environmental and natural resource R&D activities.
- Establishing a structure for developing environment and natural resources budget crosscuts.
- Developing a strategy to strengthen extramural academic R&D programs
- Developing a strategy to ensure that R&D programs are externally peer reviewed
- Developing the tools needed for policy formulation, e.g., integrated models.

Such a structure would enable the Agencies and other White House offices to develop comprehensive, balanced R&D programs that are policy relevant by establishing R&D priorities.

I would also expect to continue to play a central role in the evolution of the U.S. Global Change Research Program by continuing to co-chair the Assessment working group, and providing intellectual leadership in expanding the scope of the USOCRP to include an increased emphasis on: (i) the socioeconomic aspects of environmental changes; (ii) the impacts of, and adaptation to, environmental changes; (iii) the mitigation of environmental changes; and (iv) the development and application of assessment tools. in addition, because of my chairmanship/co-chairmanship of three international scientific and technical assessments, i.e., the WMO/UNEP ozone assessment; the WMO/UNEP IPCC impacts, adaptation and mitigation assessment; and the UNEP Global biodiversity assessment, I can provide a link between the development of the USGCRP and the current state of scientific and technical knowledge.

Question. The February 22, 1993, technology policy statement issued by the President and Vice President contains the following statement: "In 1993, the civilian share of the total federal R&D budget was approximately 41 percent. Under President Clinton's plan, the civilian share will be more than 50 percent by 1998. (page 8). In your view1 what are the implications of this policy for federal support of environmental research and development (R&D)? For example, do you expect that environmental R&D at defense agencies will be reduced and investment at civilian agencies increased? Will a greater emphasis be placed on helping the U.S. environmental technology industry?

Answer. While it is too early to predict the precise budget implications of the February 22, 1993 technology police statement, I would expect that there would be increased support for environmental R&D, consistent with the importance attached to the environment and new technologies by this Administration. In addition, all Administration statements emphasize their commitment to placing a greater emphasis on the U.S. environmental technology industry. OMB and OSTP are currently conducting a detailed crosscut of part of the federal R&D budget in order to establish funding priorities for FY 1995, and a detailed budget crosscut of all the Federal R&D programs is planned for setting priorities in FY 1996.

Question. The cleanup of toxic waste sites is one of the most serious environmental problems facing localities, including localities with recently-closed military bases. For example, the Navy base in Charleston, South Carolina, may have as many as 40 toxic sites which have to be addressed before the land can safely be used for civilian purposes. What steps do you believe the Federal Government can and should take to help localities deal with such problems?

Answer. I believe that the Federal government should work closely with the States and local communities to assess the level of contamination, establish a risk-based priority setting mechanism for clean-up that takes into account local priorities and environmental equity considerations, and provide appropriate assistance so that the land can be economically utilized as soon as possible. This approach is consistent with the approach of the Federal government in the case of closed military bases, where the Federal government is committed to working with the local communities on a fast-track cleanup with a common sense approach to protecting the public health and the environment that emphasizes speedy assessment, government teamwork, and responsiveness to communities needs. Specifically, I understand that the Federal government will establish a cleanup team at every base; conduct rapid environmental reviews; and identify parcels of land that can be safely used for quick reuse, which is vital for economic revitalization of the affected communities.

Question. The President's new plan to reduce global warming calls for $1.9 billion in Federal spending by the year 2000. What will this money be spent on, how much of it will be new funding, and from what existing activities will the other Federal funds be drawn.

Answer. The Climate Change Action Plan, which was released on October 19, 1993, describes 50 actions that will reduce U.S. emissions of greenhouse gases in the year 200() to the same level or lower than in 1990. The emissions reductions are primarily realized by accelerating the diffusion of existing technologies into the market place through partnerships between the Federal government and business, leveraging over $60 billion in private investment between now and the year 2000, by stimulating investments in technologies of the future, and by encouraging more sustainable forestry practices.

The first point to note with respect to the Federal funding portion of this Plan is that the Plan will actually generate more Federal revenues than it will cost, hence reducing the budget deficit. The programs are in DOE, EPA and USDA, with the majority being in DOE. In FY 1994 a number of existing programs will be augmented, and new ones initiated, with modest amounts of funds. DOE, EPA, and USDA are currently examining their priorities to see how to secure the required funds from within their existing budgets. The budget targets for discretionary programs are frozen for FY 1995, hence the funds required for these programs are largely expected to come from a reprioritization of existing agency programs. The Administration is currently formulating its FY 1995 budget and no decisions have been made as to what existing programs will be reduced or dropped.

Question. The Global Change Research Act of 1990 created a United States Global Change Research Program. What are the Administration's priorities for this program?

Answer. The Administration is fully committed to a strong United States Global Change Research Program. In fact, the Administration believes that the scope of the Program needs to be expanded to be more responsive to the needs of decision makers who have to formulate national and international policies. Hence, Dr. Gibbons has asked the agencies to increase their emphasis in the areas of impacts, adaptation, mitigation, and socio-economics as they develop their FY 1995 budgets. In addition, the Administration is committed to improve our assessment capability, partly through the development and application of assessment tools such as integrated models, and to improve the science-policy link.

Question. The Federal Government recently experienced losses of the NOAA-13 weather satellite and the Landsat 6 land remote sensing satellite. How will these losses impact U.S. weather prediction and land remote sensing capabilities? What steps will the Administration take to mitigate the impact of these satellite losses?

Answer. The loss of the NOAA-13 weather satellite, which would have made afternoon observations, has not yet harmed the ability of NOAA to obtain the scientific observations needed for the national weather service to make accurate weather forecasts. The national weather service is currently relying on two older satellites (N0AA 11, which is 5 years old and makes afternoon observations, and NOAA 12, which is 2 years old and makes morning observations). Because of the ages of NOAA 11 and 12, NOAA is planning to advance the launch of NOAA J (i.e., N0AA J was originally scheduled to be launched in 1995 to make morning observations) into 1994 to make afternoon observations.

The Administration is currently trying to assess the implications of, and response to, the demise of Landsat 6. In light of the advanced age of Land sat's 4 and 5, Dr. Gibbons has asked NASA, DoD and NOAA to work with OSTP to prepare an options paper by early November on how to respond to this new situation, recognizing that continuity of Landsatlike data is of paramount importance for global change research.

Question. What future role do you envisage for the National Oceanic and Atmospheric Administration in the fields of environmental monitoring, environmental science, and the development of environmental technologies?

Answer. NOAA is responsible for civilian operational weather monitoring, and is currently participating with DoD and NASA in a study to develop a plan of how to converge the operational weather monitoring systems, and some aspects of the research satellites, into a single program.

NOAA's role in weather monitoring could logically develop into long-term monitoring of climate, i.e., monitoring both the atmosphere, oceans (surface and sub-surface) and land surface. This would require an evolution in culture and philosophy to adapt to the stringent requirements for long-term calibrated observations.

The NOAA role should not be limited to operational monitoring of weather and climate, but should also extend to maintaining and improving its supporting research program. It should be noted that NOAA has two of the best research laboratories in the world, i.e., the NOAA aeronomy laboratory under the leadership of Dan Albritton, and the Geophysics Fluid Dynamics Laboratory in Princeton under the leadership of Jerry Mahlman.

NIST, not NOAA is expected to become the primary agency in Commerce for developing environmental technologies. However, there are two areas in which NOAA has a central role: (i) marine biotechnology, and (ii) monitoring technologies.

Question. The budget for the National Aeronautics and Space Administration (NASA) Mission to Planet Earth is projected to increase over the next few years while NASA's overall budget will remain constant or even may decrease. What are the Administration's priorities in the civilian space program, and how will the Administration pay for any increases in the Mission to Planet Earth Program?

Answer. As Administration officials have testified, the four highest priorities for NASA are: (i) Mission to Planet Earth, which includes the Earth Observing System; (ii) Aeronautics; (iii) Space Station and associated infrastructure; and (iv) and the Technology Initiative. Hence, even though the budget for Mission to Planet Earth is projected to increase sharply over the next couple of years, the Administration is committed to ensure that the program is adequately funded even though NASA's total budget may remain constant or even decrease. Exactly how the Administration will pay for the increased funding is currently being evaluated as the FY 1995 agency budgets are being developed.

Question. The Earth Observing System is an environmental science program and is an environmental science program and is NASA's primary contribution to the Global Change Research Program. What should be the balance between environmental science and environmental applications in NASA's budget?

Answer. The key question may not be the budgetary balance between environmental science and environmental applications within NASA, but how do we achieve balance between these two critical dimensions of environmental change among all of the agencies, and how do we ensure that the scientific information generated by NASA is available to all users. This latter requirement requires NASA to work closely with the other agencies, the scientific community, and all data users (i.e., the applications community, which includes land managers in local and State government and the private sector) to ensure that the data information system is appropriately designed and readily accessible. There clearly needs to be an increased focus on meeting the needs of the user community, other than the traditional global change scientific community.

Senator ROCKEFELLER. I thank you all very much.

I wonder if my colleague has some questions?

Senator BURNS. I am just now going over some of this while listening to you speak.

Dr. Watson, with regard to the environment, if you had it in your power to change one thing the world around, what would it be that would solve the concerns—or may I say what is your top concern and how would you solve it?

Dr. WATSON. There is no one concern, Senator. Too many of these environmental issues are interrelated. I am very optimistic we now have a meaningful dialog between the scientific community, industry, and governments in trying to solve the major environmental issues.

If I had to pick a single issue it probably would be global climate change. I believe we are moving in the right direction through the international convention of climate change. I believe we are moving in the right direction to get policies in place to reduce greenhouse gas emissions, but, without a command-and-control approach.

The President's recent climate plan talks about partnerships between industry and Government. In other words, a cost-effective way to protect the environment and, at the same time, promote energy conservation, and promote the economic wealth of our country and the countries of the world.

Senator BURNS. You have been in the bureaucracy too long. You are starting to sound like us. [Laughter.]

In other words, you think global climate change is probably our biggest threat to the environment at this time?

Dr. WATSON. As a single threat, I believe global climate change poses the largest potential danger, assuming the theoretical models are correct. The models suggest that if we continue with business as usual—primarily the energy policies of the world—then we could see, over the next century or so, an increase in temperature of many degrees centigrade, and also major shifts in precipitation patterns worldwide.

I believe that sensible energy policies today could reduce the emissions of these greenhouse gases, and, at the same time significantly reduce the threat to the global climate system. If there were to be a change in climate, there could potentially be severe consequences for agriculture, fisheries, the energy structure of the world, and major changes in ecological systems which cannot simply adapt.

Senator BURNS. You would have to agree, though, that some greenhouse gases are essential?

Dr. WATSON. Oh, there is absolutely no way that we are going to deal with the global climate situation as we did with ozone depletion, where we simply internationally banned the production and use of long-lived CFC's. What we have to do here is move the energy policies of the world in a direction where we recognize the importance of demand-side management, through energy efficiency and energy conservation, and look, where necessary, for fuel switching to renewables, such as wind, solar, biomass power, et cetera.

It is a very much more complicated problem. It involves all countries of the world far more than the ozone depletion issue did. But I believe there are ways to move forward without threatening the standard of living, whether it be in the United States or internationally, and without any major economic dislocation.

Senator BURNS. And now I have a question for Ms. Wales, being as I am so popular with Common Cause. What did you do with Common Cause? [Laughter.]

Ms. WALES. I served for 3 years as an elected member of the national governing board.

Senator BURNS. Thank you very much.

That is all the questions I have for now. I have one question that I am going to submit and it has to do with EPSCoR. If you would allow me to submit that question, I thank you, Mr. Chairman, very much.

Senator ROCKEFELLER. I look forward to that question, because we both care about that a lot.

Dr. Mary Good, who is in our next hearing, has an 11:30 speech that she has to give. So, I am going to ask just two questions.

Dr. Watson, do you know any environmental people in either the Chinese or the Indian Government?

Dr. WATSON. No. I have met scientists from both China and India as I have traveled around the world talking about ozone depletion and global warming. But I cannot really say I know any of them.

Senator ROCKEFELLER. Is it your guess that, with their enormous population, particularly in the case of China, where they have, as their Chinese name suggests, Middle Kingdom, that they are the middle of the world and everything else is of lesser importance. Do you have a belief that, no matter what it is that we do, that it will make any difference whatsoever unless those two nations are brought into compliance?

Dr. WATSON. You are absolutely correct. The major global environmental issues, ozone depletion, global warming, and biodiversity, cannot be resolved without the involvement of countries such as China and India, with their growing populations, and their growing standards of living. Anything that we do to resolve global warming or ozone depletion will be for naught if we do not have those countries onboard.

I am optimistic, India and China did sign the Montreal protocol, and have agreed to a full phaseout of CFC's, 10 years later than the industrialized countries. I am also optimistic that we may be able to get China to sign the climate convention and try to limit greenhouse gases. The basic problem, obviously, with China is huge coal reserves and, also, a very poor standard of living today, which they want to improve.

This means there must be close cooperation between the developed world and countries such as China, so that we can help with the environmental technologies that leapfrog the approaches that we have used to date. I believe this is actually a business opportunity.

But your basic premise that, without India and China, trying to deal with issues such as climate change will be very, very difficult and potentially will not succeed.

Senator ROCKEFELLER. And, therefore, your coming to specifically know, particularly some of the environmental officials in the Chinese Government is extremely important, is it not?

Dr. WATSON. Yes. There are two things. First is to engage the scientific and technical community in both India and China so that they recognize that global climate change is just not a whim of the developing countries. They have to be part of the international assessment process. And then, working with officials in the departments of environment, energy, and transportation is going to be absolutely vital.

Senator ROCKEFELLER. Thank you.

Ms. Wales, just a short question for you. To me, the greatest mystery of the last 5 years is not the collapse of the Soviet Union or anything else that I can think of, but, rather, it is how it was possible for the West Germans to so fundamentally miscalculate economically the integration of East Germany into their own country.

How would you analyze that they so fundamentally miscalculated when they are such an utterly rational and planning people?

Ms. WALES. I am not in a position to judge what information was at their disposal when they took their decision. But, from a strictly political point of view, I think that the feeling was in West Germany that there was no choice but to rush forward in trying to absorb East Germany and integrate those two countries.

What is interesting about that question is when you turn and look around the world and watch the statebreaking, statemaking process unfold, you see another opportunity for unification to take place. And that is on the Korean Peninsula. And I think it is safe to say that you could not have that kind of rapid integration on the Korean Peninsula and have it come out as well as the Germans came out.

Senator ROCKEFELLER. Fair enough.

There are questions to be asked, but not the time in which to ask them. So, I must thank all of you.

Senator BURNS. May I ask one more?

Senator ROCKEFELLER. Yes, of course.

Senator BURNS. Dr. Watson, do you support NAFTA?

Dr. WATSON. I have not the expertise at this moment to give you an answer yes or no. I like to give answers only when I am informed on the situation, and I have not read enough about NAFTA to give you a direct answer.

Senator BURNS. Thank you.

Senator ROCKEFELLER. He is sounding more like us; is he not? [Laughter.]

Senator BURNS. You had better go home and get retooled. [Laughter.]

Senator ROCKEFELLER. I am grateful to all four of you for coming here for what, admittedly, is an abbreviated hearing, but, nevertheless, a very good one.

Thank you all very much.

[Whereupon, at 10:55 a.m., the hearing was adjourned.]

APPENDIX

QUESTIONS ASKED BY SENATOR BURNS AND ANSWERS THERETO BY DR. GREENWOOD

Question. In 1979, the National Science Foundation established the Experimental Program to Stimulate Competitive Research (EPSCoR), a merit-based program designed to assist less competitive states, such as Montana, South Carolina, and West Virginia, to meet the challenge of increased competition for federal research and development funds. The NSF program has been so well-received that Congress has acted to extend it to other federal research agencies, such as NASA, DOE, USDA, EPA, and NIH. Are you familiar with the EPSCoR concept?

President Clinton has expressed his support for EPSCoR. As governor of Arkansas, an EPSCoR state, he said:

> Federal programs like the Experimental Program to Stimulate Competitive Research have helped researchers in smaller universities to more effectively compete for federal research dollars. Such programs can help assure that top-flight university researchers receive the research funding they deserve, no matter where they work. In addition, they help the breadth needed for a healthy U.S. technology base.

I hope President Clinton's experience with the EPSCoR program will translate into greater support for it within his Administration.

Generally, Dr. Gibbons, and his predecessor as the President's Science Advisor, Dr. Bromley, have spoken favorably of the EPSCoR program, but they have been vocal advocates for the program. Do you think you and your colleagues at OSTP will play a more central role in advocating the EPSCoR program in the implementation of the various federal EPSCoR efforts, in the budget process, and in national science policy formulation?

As you know, the Senate Appropriations Committee has asked the President's Science Advisor to submit a report with next year's budget on plans to integrate and coordinate all EPSCoR programs. Would you please submit for the record your thoughts on how this effort should develop?

Answer. I believe the EPSCoR states, their academic institutions, and their scientists and engineers are valuable national resources that must be fully utilized if the U.S. is to effectively compete in the 21st century global economy. I agree that EPSCoR is an excellent example of how a federal-state partnership can be used to achieve state and national goals in science and technology. EPSCoR has earned support nationally among the research community because of its use of merit review in selecting projects for support.

I understand that OSTP intends to play a more central role in coordinating the various federal EPSCoR efforts, not only in their implementation, but also in the EPSCoR budget process and national policy formulation. I support this and would, if confirmed, be directly involved in the EPSCoR Interagency Coordinating Committee (EICC) and would use the Memorandum of Understanding (MOU) among the federal agencies with EPSCoR programs as the basis for our actions. As an educational first step, I would participate in the Ninth Annual National EPSCoR Conference to be held November 7-10, 1993 in Rapid City, South Dakota to gain first-hand information on the program and on the level of federal coordination efforts.

Question. As you know, the Senate Appropriations Committee has asked the President's Science Advisor to submit a report with next year's budget on plans to integrate and coordinate all EPSCoR programs. Would you please submit for the record your thoughts on how this effort should develop?

Answer. A Memorandum of Understanding (MOU) was recently signed by representatives of the Department of Energy, the Environmental Protection Agency, National Aeronautics and Space Administration, the National Science Foundation, and the U.S. Department of Agriculture to establish interagency cooperation on EPSCoR programs. The MOU recognizes the EPSCoR Interagency Coordinating Committee (EICC), established on July 14, 1992, as the mechanism for interagency communication and coordination. It is my understanding that although the Depart-

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ment of Defense and the National Institutes of Health have not yet signed the MOU, they have participated in the EICC. If confirmed, I would encourage the steps necessary to effect coordination of the federal-wide EPSCoR effort. Such actions could include:

A representative of OSTP could serve on the EICC to ensure interagency cooperation and coordination.

The EICC could provide leadership and guidance in the coordination of activities common to all programs (e.g., budget requests, program guidelines, proposal merit review, technical assistance to states in developing their S&T enterprise, and program monitoring).

OSTP could explore the option of making the EICC a component of the formal FCCSET structure.

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